THE GROWTH AND SIGNIFICANCE OF THE COVENTRY CAR COMPONENT INDUSTRY, 1895-1939

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Abstract

The thesis analyses the Coventry car component industry and investigates its significance to the British motor industry between 1895-1939. Traditionally, historians have compartmentalized their analyses of the motor industry by focusing on the car assembling sector at the expense of the car component makers. Consequently, although Coventry played a leading role in the motor industry between 1895-1939, its component sector has remained neglected by economic and social historians.

Nevertheless, Chandler and Lewchu k have suggested that British motor manufacturers were inefficient due to an absence of backward integration in the industry during the interwar period. However, in common with previous investigations, their assumptions were not based on an archival analysis of the car component industry. By overlooking *why* the component sector was heavily utilised in Britain, historians have assumed that British car manufacturers rejected integrated production structures due to either managerial failure or labour resistance to Fordism.

This thesis sheds new light on the organisation of the motor industry between 1895-1939, by drawing from primary sources which hitherto have been overlooked or inaccessible to historians. Moreover, the study offers a new perspective by arguing that the production practices of the car assemblers can only be assessed when they are analysed in conjunction with the car component sector.

Unlike previous studies, the thesis argues the car assemblers use of the component sector was the optimum production strategy. Whereas mass car consumerism in the US allowed American based firms to integrate production, the shallow social depth of the British car market required manufacturers to implement annual model changes. This process could only be achieved through the extensive use of the component sector which proved the most flexible method of manufacture. On a more general level, the thesis challenges Chandler's suggestion that industrial structure *followed* business strategy. Thus the dis-integrated structure of the motor industry reflected Britain's domestic car market rather than deficiencies in strategy at a managerial level.

Contents

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This Thesis is dedicated to my parents Martin and Gail Beaven for all their support and encouragement.

List of Charts, Graphs and Tables.

Introduction

The thesis is primarily concerned with examining the structure of the Coventry car component industry and analysing its significance and relationship with British car assemblers between 1895-1939. In order that the industry is placed in an appropriate analytical framework, it is important to clarify the term structure. In analysing and defining the structure of the industry, the study will pursue six major areas and objectives: (i) Create a data base of the number and size of firms (ii) Examine the circumstances surrounding the entry and departure of firms in the industry (iii) Analyse the sources of finance open to firms (iv) Investigate the ownership and management of firms (v) Determine the degree of rationalization in terms of product standardization and production techniques (vi) Investigate the relationship between car manufactures and suppliers.[1] One of the main problems when evaluating the structure of the component industry is its vast diversity, both in terms of the range of components produced and the geographical dispersion of firms. Thus, in order to keep the project within manageable proportions the research will be conducted along certain parameters. First, the geographical area under study is the Coventry region. Coventry played a key role in the development of both car and component manufacturers, due to the city's distinct contribution to the origins of the British car

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[1] Works cited throughout the thesis are published in London unless otherwise stated. For a similar definition of 'structure' in an industrial context see J.S. Dunnett, (1980), *The Decline of the British Motor Industry*, p. 18.

industry and its central role in the subsequent instability and decline of the industry.[2] However, the thesis will avoid treating the component sector in isolation since an emphasis will be placed on the connection between the Coventry component sector and British car manufacturers as a whole. Moreover, this analysis will be set against the structural changes that occurred in the British motor industry between 1895-1939. Second, the research will focus on five major branches of the component trade, the manufacture of engines, stampings and castings, electrical equipment, bodies, and tyres and wheels. These distinct five branches were selected for analysis since the contemporary component manufacturers organised their industry in this fashion through the formation of trade associations and trade agreements. Finally, as a prime objective of the study is to analyse the interaction between car assemblers and component makers, analysis will not include firms which produced accessories for the general public.

The initial problem when embarking on a study of this nature is that firms involved in the component industry were generally small family concerns possessing a low profile. Consequently, to some extent, the surviving source material placed limitations on the research conducted. Unlike car manufacturers such as Daimler, Rolls Royce and Jaguar, component manufacturers were rarely in themselves the subject of media attention or contemporary literature commemorating the industry's progress. Many of the small privately owner-managed concerns saw little

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[2] D. Thoms and T. Donnelly, (1985), *The Motor Car Industry in Coventry Since the 1890s*, Preface.

value in keeping minute books detailing business decisions since they were largely answerable only to themselves. The analysis of the financial structure of these firms also proved difficult as only a handful of firms retained a consistent run of balance sheets. Moreover, firms were not required to produce standardized balance sheets until 1929, which meant that an extensive comparative fiscal analysis of firms would have been an undependable exercise. Consequently, the fiscal analysis of Coventry car component firms was restricted to the financial sources of firms where there existed a wealth of consistent primary sources.

However, although these limitations had the affect of restricting research in certain areas, there was a rich collection of source material which, hitherto, had remained neglected. Since previous studies have largely drawn evidence from the major car assemblers, such as Daimler, Rover and Standard Motor Company, the research will offer a new perspective on the structure of the British motor industry by analysing primary sources from the component sector of the industry.

In order to utilise fully the existing primary source material the study's methodology has drawn from both qualitative and non-qualitative research techniques. The non-qualitative sources have primarily been used to analyse the changing size, product variation, ownership and output of Coventry component firms. A most valuable source in this respect was the City of Coventry Trade Directories and Official Guides which provided information, to varying degrees of detail, on the firms engaged in car and component manufacture in Coventry. The directories often listed the proprietors and directors of firms, the products

made, customers and the date of company formation. However, certain drawbacks did emerge with an over reliance on the information contained in trade directories. In some instances trade directories accidentally omitted firms that were still trading, and failed to register changes in ownership after take-overs or mergers. Clearly, when compiling a data base on the number of Coventry firms it was necessary to consult other sources. Perhaps the most useful sources from which to cross reference the data gleaned from directories, were the trade journals. For example, publications such as *The Motor* and *Autocar* listed annually the Coventry component firms that displayed products at the yearly motor shows. Also the years chosen to create a data base of component firms were, to some extent, dictated by the availability of surviving directories. For example, although the data collected for years 1902, 1912, 1920, 1926, 1936, provide an effective framework from which to demonstrate the changing pattern of the component industry, these precise years also offered the most accurate and comprehensive information on the Coventry component industry.

The non-qualitative nature of the component industry was also ascertained by the information supplied by the Society of Motor Manufacturers and Traders which published various reports throughout the period on the size, number of workers, output and product variation of the industry. Similar information on the state of the motor industry was also available from various editions of the *Times* newspaper and in the Political and Economic Planning Report of 1950.

The non-qualitative methodology proved effective in measuring the changing structure of the Coventry Car

Component industry. However, in order that the structure was fully explained it was necessary to consult qualitative evidence. Source material of this kind was numerous but surprisingly had often been neglected by previous historians. For example, despite heavy bombing of Coventry's engineering firms during the Second World War, the City Record Office and the Modern Records Centre at the University of Warwick hold over thirty company archives of Coventry firms engaged in car and component manufacture since the 1890s. Indeed, for over twenty years both groups have pursued a policy of collecting and preserving business records. The vast majority of these firms, such as Van Raden, Cornercroft and Coventry Motor Fittings provided fresh areas of research since, prior to this study, they had never received academic attention. These sources often comprised minute books, cash books, balance sheets, production sheets, customer correspondence and company histories. Not only did these sources reveal information on the personalities who owned the firm, but they also offered an invaluable insight into a company's financial position, product strategy, and customer relations. However, in some cases analysis of this data alone was not sufficient to ascertain a company's position, especially in financial matters which were sometimes destroyed, omitted, or 'massaged' in official company literature. The under-utilised bank archives proved an invaluable source in providing an accurate account of a company's financial position. These archives revealed the sources of finance open to firms, the extent firms relied on bank loans and the fiscal relationship between car manufacturers and their suppliers. The daily journals of the Coventry branches of Lloyds, Midland and

Barclays presented a vivid picture of the Coventry business community. Indeed, the information contained in the journals was not confined to financial matters since products, output, customers and business strategy were also discussed. The bank archives also offered detailed information on component firms whose records no longer exist. Likewise, the Board of Trade files at the Public Record Office were the only surviving source material available for some small firms. These files contained details on the owners, shareholders and the type of product the firm made. Birth certificates and will probates deposited at Somerset House were also useful in tracing individuals, family business interests and the social back grounds of entrepreneurs involved in the Coventry car component industry. Finally, insights into the origins and organisation of firms which had left behind little or no documentary evidence were gained through oral history interview with former employees and owners. Moreover, extensive use was made of the oral history archives housed in the Coventry Record Office and Coventry University.

The source material is examined thematically, avoiding a narrative account of the industry which a chronological framework may have induced. Therefore, the major themes which in some way influenced the structure of the component industry are the subject of individual chapters. The criteria for the selection of themes were based on two main principles. First, the themes should not extensively overlap, and second they should relate to one another in order to identify effectively

the structure of the industry and to avoid artificially compartmentalizing the component trade.[3]

Chapter one, is divided into two sections, comprising an historiography of the motor industry and an analysis of recent economic and social models relevant to a study that focuses on industrial history. Chapter two analyses the nature of the motor industry in Britain between 1896-1939. The objective of this chapter is to provide the reader with a background to the major car manufacturing centres in Britain and to place the case study of Coventry into an historical context. Chapter three initiates the analysis of the primary source material relating to the Coventry car component industry. This chapter provides the foundations for the following chapters since it identifies and analyses the entry and exit of firms and the nature of the competitiveness in the component industry between 1895-1939. Chapter four builds on this research by investigating the sources of finance open to firms, assessing the size of firms (in terms of capital) in the industry and the degree to which the industry was supported by financial institutions. Chapter five analyses the ownership and management of firms. Here, the social composition of owners, the significance of family firms and the extent to which professional management were employed are investigated. Chapter six examines the claim that the component industry was inherently inefficient due to a reluctance to embrace new technology and mass production techniques. Consequently, this chapter focuses on the output of firms and the nature of demands made by car assemblers.

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[3] For the thesis' definition of the term industrial 'structure' see p. 1.

Chapter seven pursues this theme by analysing the relationship between the car component makers and the car assemblers. This section examines why, unlike the American car firms, British car assemblers were reluctant to engage in backward integration. The chapter investigates the rationale behind this production strategy by examining the significance of the British car market in the 1920s and 1930s. Thus although the thesis is grounded in original research, the study will place its conclusions against other appropriate theoretical perspectives.

Finally the conclusion will illustrate how these themes had a bearing on the component industry and how Coventry's car component industry professed a wider relevance to the structure of the motor industry as a whole. Thus, by combining both qualitative and non-qualitative research methods and analysing the sources thematically, it was possible to construct a detailed analysis of the Coventry component industry and its relationship with the wider motor industry.

Chapter One
A Literature Review: A Historiography of the British Motor Industry and Themes in Business History

This chapter will review secondary source literature relating to the British motor industry between 1895-1939 and examine current themes and discussions within business history. Consequently, the chapter is divided into two distinct sections. The first section will consist of a historiography of the motor industry which will analyse the various methodologies and conclusions that have been offered by historians over the past fifty years. A major objective will be to identify gaps in the existing knowledge of the motor industry where an original contribution to our understanding of the car component trade can be offered. The second section will investigate current themes in business history which will set the examination of the car component industry into an appropriate analytical structure. The objective of this section will be to select concepts, models and themes which will most effectively analyse the *structure* of the industry and its interaction with the car assemblers.

The British Motor Industry: A Historiography

During the last twenty years, the growth and development of the British motor industry has been the subject of a number of academic studies. Prior to this period, histories of the industry had emerged largely from in-house company projects or from veteran car enthusiasts. However, even during this period, there

were a handful of historians who became interested in the motor industry, and their methodology has been important in influencing subsequent historians who have entered this research field. The pioneering research of Maxcy and Silberton, which was published in 1959, was the first major study which attempted to analyse the structure and development of the British motor industry between 1895-1956. It's main aim was to analyse the costs of production in the motor industry. The analysis was placed in a geographical context with frequent comparative references to developing motor industries in other countries. However, despite attempting to examine production costs, the authors, when defining their research parameters, interpreted the motor industry as mainly comprising of motor vehicle manufacturers.[1] Thus, although Maxcy and Silberton acknowledged that car manufacturers purchased almost two thirds of their components from external suppliers, there was an absence of analysis of archival research relating to the component industry. However, the deficiency of such analysis did not prevent the authors from passing judgement on the developing car component industry between 1895-1959. Thus, in explaining the comparatively slow growth of Britain's motor industry, the authors asserted that:

> almost certainly, however, the achievement of the British industry was less than it would otherwise have been because of the lack of an efficient components industry, William Morris, who pursued a deliberate policy of buying a high proportion of his components from outside suppliers, had to turn to the United States in 1914 when he could find no British firm which could provide large

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1 G. Maxcy and A. Silberton, *The Motor Industry*, (1959), preface.

> enough quantities of standardized parts to fulfil his growing requirements.[2]

However, despite such assertive statements, analysis of the component industry was restricted to references to the development of large component firms. Indeed, there was no attempt to investigate the small firms which numerically dominated the component industry and consequently, the *reasons* why component firms were unable to meet Morris' demands in 1914. Evidence for their hypothesis was drawn almost exclusively from material relating to car assemblers, and therefore it is perhaps no surprise that the blame for slow growth was shifted from the car assemblers to the component sector.

Certainly, Maxcy and Silberton did not have access to the source material available today. However, their influence was considerable since subsequent historians have adopted a similar research methodology by compartmentalizing the motor industry in terms of car assemblers and car component makers. By adopting this research approach, the car assemblers have been the focus of attention whilst the component sector, which was recognised as having played an integral role in the industry, was examined only in a superficial manner. Thus, although the influential article by Saul questioned some of Maxcy and Silberton's assumptions concerning the development of the component industry, the vast majority of his research was devoted to the growth of the car assemblers to 1914. Whilst Saul's article, which was published in 1962, did not examine archival records relating to the component industry, he noted

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[2] *Ibid*, p. 13.

that 'it was the attitude of the car manufacturers themselves - their addiction to the more traditional engineering methods - which held up the growth of component production'.[3] Nevertheless, this tentative line of inquiry was never pursued and once again the motor assemblers became the focus of attention and the component suppliers became the focus for blame. In 1964, Turner in his study, *The Car Makers*, claimed that:

> it was the lack of an efficient component industry which was to handicap Morris (and other British producers) in the years before and after the First World War. So uneconomic were some of the British component makers that Morris went to America and came back with an engine bought for £25 - an engine which White and Poppe admitted they could not supply for less than £50.[4]

Further evidence to support this damning indictment of the British component industry does not emerge in Turner's study. In the chapter which analysed the structure and organisation of the motor industry between 1895-1939, only two brief paragraphs were devoted to the car component industry. In common with Maxcy and Silberton, Turner made no attempt to investigate the industry in any depth and consequently analysis was restricted to the development of the large component firms such as Lucas and Dunlop.[5]

Over the past twenty years, there has been a number of academic studies devoted to the motor industry.[6] Although these more recent research projects have added to our knowledge of

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[3] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, (1962), p. 37.
[4] G. Turner, *The Car Makers*, (1964), p. 19.
[5] *Ibid*, p. 20.
[6] For a recent review of research concerning the motor industry see, T.C. Barker, 'Slow Progress. Forty Years of Motoring Research', *Journal of Transport History*, 14, (1993), p. 161.

the car assemblers, they have not furthered our understanding of the component industry to any large degree. Two important contributions were Overy's *William Morris, Viscount Nuffield* (1976), and Church's *Herbert Austin. The British Motor Car Industry to 1941* (1979). Both authors attempted to analyse the motor industry through the experiences of two leading motor manufacturers, William Morris and Herbert Austin. Overy's study focuses rather narrowly on Morris at the expense of an adequate analysis of the structure of the industry. However, there was a great potential in this study to explore the component sector's key role in the motor industry since Morris was the pioneer of assembling cars from bought-out components in Britain. In examining Morris' relationship with suppliers, Overy implies that the component sector could not cope with Morris' demands due to their inability to imitate Morris' organisational efficiency. Thus, much is made of Morris' take-over of the engine makers Hotchkiss in the 1920s where production was increased from 300 to 600 engines per week.[7] However, a central weakness in the study, was Overy's reliance on secondary source material and public statements and speeches made by Morris. The limited extant primary sources relating to Morris, and Overy's apparent reluctance to investigate the surviving sources of component firms which conducted business with Morris, ensured that no fresh light was cast on the relationship between car assemblers and their suppliers. Although Church's study was more successful in integrating a biography of Austin's life with an analysis of the motor industry, there was a tendency to exaggerate Austin's achievements and

[7] R.J. Overy, *William Morris, Viscount Overy*, (1976), p. 27.

distort his overall influence on the development of the motor industry. For example, Austin placed very little emphasis on purchasing components from outside suppliers and, thus in Church's analysis of the motor industry, the integral importance of the component sector to the motor industry was given very little coverage.

However, in the late 1970s and early 1980s, some historians began to follow a line of inquiry which was to become firmly established by the 1990s. These historians moved away from using biographies as an insight into the motor industry and instead focused attention on the changing structural features of the industry. Such a method of analysis would inevitably involve some reference to the component sector. For example, although the prime objective of the research of Richardson (1977) and more recently Adeney (1988) was to identify and explain trends within the car *assembling* industry, they both devote a brief section to the component industry. However, the authors did not break with tradition, and instead continued to confine analysis of the car component industry to a handful of large firms which emerged prior to the Second World War. For example, while Adeney implied that small component firms experienced difficulties during the 1930s, he drew no evidence from this section, and instead concentrated on the multi-national firms such as Dunlop and Triplex.[8] Clearly, the investigation of the component industry through the analysis of one or two major companies raises two fundamental problems. First, although large companies such as Dunlop and Lucas had emerged during

[8] K. Richardson, *The British Motor Industry 1895-1939*, (1977), pp. 90-94. M. Adeney, *The Motor Makers. The Turbulent History of Britain's Car Industry*, (1988), pp. 142-158.

the 1920s, it is clear that the structure of the component industry was, on the whole, derived from small locally based component firms who still played an important role in supplying car manufacturers until the early 1960s.[9] Second, the analysis of large component firms sheds little light on the business practices and company interaction in the Coventry motor industry since, between 1895-1960, the vast majority of component concerns in Coventry were small units of production.

A study which examined the British motor industry within a regional context was *The Motor Industry in Coventry Since the 1890s* (1985) by Thoms and Donnelly. The book analysed the changing structure of the motor industry both in a local and wider economic context. Consequently, research was not restricted to investigating the development of the car assemblers, but attention was also given to other sectors of the regional economy such as component, machine tool and aircraft firms.[10] This approach was a significant departure from the more compartmentalized studies on the motor industry which often failed to investigate the relationship between car assemblers and car component makers. To a certain extent Thoms and Donnelly redressed this imbalance by highlighting the credit arrangements that car manufacturers secured from component makers during the development of the motor industry in Coventry. Their research uncovered traces of a 'pyramid of debt', at the top of which was the car manufacturer. However, since the component industry was on the periphery of their research parameters, the investigation was not a comprehensive

[9] Turner, *The Motor Makers*, p. 52.
[10] Thoms and Donnelly, *The Motor Car Industry in Coventry Since the 1890s*, (1985), preface.

analysis of the affect of car manufacturers' business policy on their suppliers and the consequences for the structure of the Coventry car component industry.[11]

A significant contribution to the analysis of the structure of the motor industry has been made by Lewchu k. In a series of articles and in his book *American Technology and the British Vehicle Industry* (1987), Lewchu k argued that the structure of the motor industry could only be understood through the analysis of production methods utilised in car firms between 1895-1939. Lewchu k asserted that British firms failed to realise their potential due to the failure of managers to adopt the direct labour control required for the moving assembly line and implement American technology.[12] Lewchu k utilised Chandler's comparative model which suggested that the British economy declined during the late nineteenth and early twentieth centuries due to a failure of British management to emulate their American counterparts in creating a professional managerial class.[13] Thus, while the 'new managerial class' imposed strict supervision over workers and fixed wages according to time and motion studies, the 'British system of mass production' relied on the piece work system which gave workers the responsibility of setting their *own* production targets. Lewchu k presented a production-centred model to explain the structure of the motor industry between 1895-1939, and here lies the major weakness of the study. Lewchu k did not investigate how the nature of *demand* may have affected the structure of the industry. Indeed,

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[11] *Ibid*, preface and chapters 2,4.
[12] W. Lewchuck, *American Technology and the British Vehicle Industry*, (Cambridge, 1987), p. 185.
[13] See the following section of this chapter for an analysis of Chandler's model.

there was no consideration of how the different product markets in Britain and America shaped the organisation of the motor industry.[14] Moreover, since Lewchu k's analysis of the motor industry was largely confined to the production practices within car assembly plants, scant attention was directed to the car component industry. Where Lewchu k referred to the component industry, his argument was weak. In explaining why, in contrast to America, few British firms purchased components from suppliers during the early years of the motor industry, Lewchu k cites two 'critical factors':

> The first was the greater experience of British workers on metal working machines. This made the British worker more versatile and better suited to manufacturing operations in which they might be called upon to do a large number of diverse, if unskilled, tasks. Second, British firms found it easier to raise capital than did US firms. Ford, for instance, had to use outside suppliers for the majority of manufacturing operations because he was unable to raise sufficient capital to buy his own machines.[15]

However, these factors, which were not supported by any evidence drawn from the component industry, does not explain why even the smallest car maker, with very limited financial resources, attempted to produce the whole car during the early twentieth century. Furthermore, Lewchu k's analysis does not shed light on why a growing number of both large and small car manufacturers began to utilise the car component sector between 1908 to 1914. A more fruitful perspective from which to

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[14] For two recent critiques of Lewchu k's model see: S. Tolliday, 'Management and Labour in Britain 1896-1939', in S. Tolliday and J. Zeitlin (eds), *The Automobile Industry and its Workers*, (1986), p. 32. K. Williams et al 'The Myth of the Line: Ford's Production of the Model T at Highland Park, 1909-16', *Business History*, 35, (1993), p. 69.

[15] W. Lewchu k, 'The Motor Industry', in B. Elbaum and W. Lazonick (eds), *The Decline of the British Economy*, (Oxford, 1986), p. 138.

analyse the relationship between suppliers and car assemblers is to incorporate the concept of product demand. British car assemblers' preference to attempt to produce the whole car itself during the early years of the motor industry was more due to the customers' demand that the car be individualistic, and in some cases cars were made to order. Even after 1908, when firms began to produce larger batches of cars, the individualistic element in car manufacture was retained by ensuring that there were frequent changes in design. Thus unlike the US, Britain required more flexible production techniques, a process achieved by extensively utilising the component suppliers. Lewchu k's attempt to explain the structure of the motor industry in Britain, then, was somewhat flawed by the absence of any detailed analysis of the product market and the role of the component industry.

The few studies which have focused attention on an aspect of the car component industry have also failed to examine the interaction between suppliers and car assemblers. Moreover, where historians have made an attempt to analyse the component industry, the research is usually limited to a case study of one firm. One of the first studies to investigate the origins and development of a component firm was *Lucas, the First 100 Years* by Knockolds (1976).[16] Although the book provided a useful insight into a firm's diversification from cycle to car components, the study was placed firmly in the narrative tradition of business history. There was no attempt to set out an analytical framework within which the growth of the company could be examined. Consequently, it is difficult to gain a sense

[16] H. Knockolds, *Lucas, the First 100 Years*, vol. 1, (1976).

of how the component industry developed in Britain since the 1890s. A more penetrating study of Lucas was conducted by Church in 1978 in his article 'Innovation, Monopoly and Supply of Vehicle Components, 1880-1939: the Growth of Joseph Lucas Ltd'. However, although Church provides a useful insight into the business strategy of what was to become the largest component supplier in Britain, his research did not reveal the structure of the component industry and the business practice of small firms which predominated the sector in Coventry and in Britain generally.[17] Finally, Church's analysis of Lucas generally took place in isolation from the rest of the car industry. Thus, important issues such as the pressure car manufacturers' exerted on component firms' financial position and production policy were only briefly investigated.[18] The only other component firm to be subject to a detailed academic analysis was Dunlop. However, the objectives of Geoffrey Jones' study (1984) were to examine the growth and performance of a British multinational rather than investigate the firm's involvement in the car component industry. Consequently, although the article provides some useful material on Dunlop's origins, for the historian interested in analysing the structure of the car component industry in Britain, it is of only limited use.[19]

Although an analysis of the car component industry is integral for an understanding organisation and growth of the motor industry in Britain, a review of the secondary source literature

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[17] R. Church, 'Innovation, Monopoly, and the Supply of Vehicle Components in Britain, 1880-1930; The growth of Joseph Lucas',(1978), *Business History Review*, 52.
[18] *Ibid*, pp. 240,244,246.
[19] G. Jones, The Growth and Performance of British Multinational Firms before 1939: The Case of Dunlop, *Economic History Review*, 37, (1984).

has revealed that few historians have investigated the subject beyond examining one or two large component firms. However, this has not prevented historians from formulating sweeping conclusions which have implied that the 'inefficient component industry' retarded the growth of the British motor industry. Nevertheless, there has been little or no archival research which analyses the growth and development of the British car component industry between 1895-1939. Furthermore, the component industry's integral role in the organisation of the motor industry during this period has also been consistently neglected. Clearly, there exists a vacuum in our knowledge of the supply side of the British motor industry. In order that the industry's development and structure can be analysed effectively, the following section will identify important themes within business history which, in the proceeding five chapters, will be applied to the Coventry car component industry between 1895-1939.

An Analysis of Current Themes in Business History.

The analysis of a previously under-researched industry presents certain problems for the historian. Since the Coventry car component sector has remained neglected by historians, it is imperative that the chosen research methodology analyses effectively the structure and development of the industry.[20] Consequently, in order to achieve this objective, and to keep the study within manageable proportions, the examination of the

[20] For definition of 'structure' and an outline of the research parameters see the introduction of the thesis.

structure and development of the industry will take place through the analysis of certain key themes. The key themes selected, will not only possess a pertinence to the car component industry, but will also hold a wider relevance to debates surrounding economic and business history generally.

The first step in defining the structure of the industry is to quantify the size of the industry and the nature of the car component market in Coventry. Key issues here include an analysis of the number of firms entering and departing from the industry in order to assess the competitiveness in the product market in the five branches of the component trade. A useful model which sheds light upon the circumstances surrounding a firm's entry and departure from an industry is Hirschman's 'Exit, Voice and Loyalty' concept (1970).[21] Hirschman argued that economists had tended to concentrate on the 'exit' adjustment process, whereby firms did not provide customer satisfaction and the subsequent fall in profits forced the firm out of the industry. The alternative mechanism which he claimed had been consistently overlooked was the 'voice' and 'loyalty' options. Here, although customers were dissatisfied with the products purchased, they did not replace their supplier, but instead, expressed their dissatisfaction with the management of the firm. Once their demands had been met, the buyer would then 'loyally' continue to purchase from the supply firm. However, a key factor which determined whether a customer adopted the exit or voice option was the nature of the product market. If the structure of the industry was highly competitive,

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[21] Hirschman, *Exit Voice and Loyalty. Responses to Decline in Firms, Organizations and States*, (Harvard, 1970).

then customers would tend to adopt the exit mechanism. On the other hand, the exit option was unavailable when a market had reached a pure monopoly status.[22]

More recently, the model had been applied to an aspect of the motor industry by Foreman-Peck (1980).[23] Through his analysis of the Rover Car Company, Foreman-Peck noted that the voice option was utilised by Rover's suppliers and clearing bank as they were not prepared to let an important customer experience bankruptcy. However, Foreman-Peck concluded that the suppliers' and the bank's reluctance to adopt the exit mechanism ensured that Rover continued with 'an inappropriate industrial structure'.[24]

Since the 'exit, voice and loyalty' concepts focus on the interaction between buyer and vendor, it is an ideal model to apply to a supply industry such as the component trade. Moreover, this model is important as it will also reveal the nature of competition within a particular industry. A high number of component firms entering and leaving the industry would indicate that most car assemblers adopted the exit option and that the competition was fierce in the supply sector. Conversely, widespread use of the voice mechanism would suggest that competition was limited and car assemblers were willing to negotiate with their suppliers as oppose to consistently switching loyalties.

Another important structural feature which will be analysed is the sources of finances that were available to Coventry

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[22] *Ibid*, p. 33.
[23] J. Foreman-Peck, 'Exit Voice and Loyalty as Responses to Decline: The Rover Company in the Inter-war Years', *Business History*, 23, 1981.
[24] Foreman-Peck, 'Exit Voice and Loyalty as Responses to Decline, p. 204.

component firms. This theme opens the debate surrounding the relationship between financial institutions and manufacturing industry between 1895-1939. For some time, historians have considered that the British monetary institutions failed industry. Elbaum and Lazonick, for example, claimed that the banking system was one of many institutional rigidities which retarded Britain's economy. They have suggested that the financial institutions concentrated on short term credit creation, having consistently avoided developing a long term strategy with British industry. Moreover, the two historians accused the banks and capital markets of investing in more profitable overseas ventures rather than domestic industry.[25] To some extent, this stance was supported by Harrison, who discovered that firms involved in the British cycle industry found it extremely difficult to generate funds from the capital markets. Indeed, Harrison's research concluded that there was a general reluctance on behalf of the Stock Exchange to deal with smaller firms.[26]

Recently, however, Ross defended the banks' role in financing industry by showing that the banks did supply large sums of money to British industry between 1918-1939. Although Ross acknowledged that the banks did not actively promote new investment opportunities in British industry, he claimed that they did accommodate all credit-worthy firms with short term loans. This, he argued, constitutes a re-evaluation of the banks' attitude to industry since they 'were considerably more involved

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[25] B. Elbaum and W. Lazonick, 'An Institutional Perspective on British Decline', in B. Elbaum and W. Lazonick (eds), *The Decline of the British Economy*, (Oxford, 1986), pp. 1-17.

[26] A.E. Harrison, 'Joint Stock Company Flotation in the Cycle, Motor-Vehicle and Related Industries 1882-1914', *Business History*, 23, (1981).

in supporting their industrial customer than they were hitherto been given credit for'.[27] Thus, in exploring the sources of finance open to car component makers, the study will not only identify certain trends, such as the capital size of firms and the ease with which firms attracted capital, but it will also investigate the general debate concerning the banks and industry between 1895-1939.

In examining the structure of the Coventry car component industry, it is imperative that attention is focused on the ownership and management of the firms. Over recent years, the analysis of the development of managerial structures in British industry has increased considerably. The catalyst for this growth in literature was the influential work of Chandler. In his book, *Strategy and Structure* (1962)[28] and in subsequent articles published during the 1970s to 1990s, Chandler outlined his model which sought to explain the differences in the development and organisation of firms between Britain and America during the late nineteenth century to 1939. Chandler argued that a central causal factor which, explained the differences in the size and structure between British and American businesses, was the role of the owners and managers of firms. Thus Chandler asserted that in Britain:

> the family wanted to retain and manage its birthright. In the United States mergers brought administrative and centralization and industrial rationalization. In Britain they remained federations of autonomous family enterprises. Until the 1930s, British mergers rarely

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[27] D.M. Ross, 'The Clearing Banks and Industry - New Perspectives on the Inter-War Years', in J.J. Van Helton and Y. Cassis (eds), *Capital in a Mature Economy. Financial Institutions, Capital Exports and British Industry 1870-1939*, (Aldershot, 1990), p. 65.

[28] A. Chandler, *Strategy and Structure: Chapters in the History of Industrial Capitalism*, (Cambridge, 1962).

> brought economies of scale or other advantages of administrative co-ordination.[29]

Chandler also attributed the apparent failure of Britain to participate fully in the 'new industries' and meet the competition from the United States and Europe to 'managerial failure':

> that is, the continuing existence of the family firm helped deprive Britain of a class of trained managers and sets of technological and managerial skills that became increasingly essential, not only to technically advanced managerial skills but also to the operation of modern urban, industrial economies.[30]

Thus, Chandler claimed that family firms possessed a number of features which ensured that they were at a constant disadvantage to professionally run organisations. He maintained that family firms were reluctant to float the concern for fear of losing control; that they pursued short-term financial gain by drawing high dividends; and that they appointed into senior management positions family or personal friends. At the heart of Chandler's thesis was the assumption that structure (the design of the organization) follows strategy (the firm's long term policy). In essence then, Chandler's model was an internal analysis of a firm's development and does not place business within an economic or social context. Thus in *Scale and Scope*, Chandler acknowledges that 'this study is an internal history of the central institutions in managerial capitalism, rather than an analysis of the broader impact of that institution on the polity or society in which it appeared'.[31] This statement implies that the analysis of a firm can be isolated from the institutions that

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[29] A. Chandler, 'The Growth of the Transnational Industrial Firm in the United States and the United Kingdom: A Comparative Analysis', *Economic History Review*, 33, (1980), p. 402.
[30] *Ibid*, p. 410.
[31] Chandler, *Scale and Scope*, p. 13.

shaped it.[32] For example, this research methodology would stress the importance of a car component firm's internal business policy since this would override factors such as the sources of finance available, the branch of the component industry it traded in, and its relationship with the car assemblers.

Clearly, such an internal model which did not consider important external variables that may have been instrumental in shaping British firms between the 1870s to 1939 stimulated much debate on the role of the family and industrial managerial organisation. Payne's study into the emergence of large scale companies broadly agreed with Chandler's assumption that family firms had a negative impact on the organisation and development of British business (1967). However, unlike Chandler, Payne did not adopt an internally based analysis which suggested that structure followed strategy but, instead, emphasised the importance of the social and economic context of the firm. Thus, Payne cited the absence of any legal framework to enable firms to become larger public companies as an important limitation on the growth and ultimate size of the business in Britain. However, even after the final piece of legislation which enabled firms to attain joint-stock and limited liability status, the response of firms was slow.[33] Consequently, Payne then added a cultural dimension to his analysis by suggesting that Britain was inflicted by an entrepreneurial weakness. He suggested that many traditional British entrepreneurs were 'especially reluctant to raise new capital

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[32] For a useful critique on Chandler's model see B. Supple, 'Scale and Scope: Alfred Chandler and the Dynamics of Industrial Capitalism', *Economic History Review*, 64, (1991).

[33] P.L. Payne, 'The Emergence of the Large-Scale Company in Great Britain, 1870-1914', *Economic History Review*, 20, (1967), p. 520.

through procedures that might have weakened their control over their family firms'.[34] According to Payne, these weaknesses were derived from 'sociological factors' peculiar to Britain. While nepotism among professional entrepreneurs was frowned upon in America, this tradition, which had emerged from the family firm, continued unabated in Britain. Payne concluded that :

> the structure of many British companies inhibited the ascent of the brilliant salaried official. Leadership by inheritance applied in a great range of industrial activities...all too frequently the channels of advancement were blocked by family control. And even in those cases in which the controlling family group threw up men of supreme business skill there was...a constant haemorrhage of ability from industry and trade into land ownership and politics.[35]

Recently, however, a number of historians have questioned the central assumption that family firms were instrumental in retarding British business. Church has suggested the assumption that family firms were governed by short-term financial gain does not stand up to a detailed analysis of the evidence. He pointed out, that while many family firms ploughed substantial proportions of the profits back into the concern, a large number of public companies were under pressure from shareholders to sanction high dividends.[36] Moreover, Church also attempted to dispel the assumption that professional management was innately better than family appointments. Church highlighted evidence that criticized the professional manager's narrow, specialist professional training as engineers, lawyers and accountants who were 'not necessarily effective administrators

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[34] *Ibid*, p. 526.
[35] *Ibid*, pp. 538-9.
[36] R. Church, 'The Family Firm in Industrial Capitalism: International Perspectives on Hypotheses and History', *Business History*, 35, (1993), p. 22.

or competent in human relations'.[37] Church concluded his critique of the 'family firm failure model' by asserting that there was very little evidence to suggest that family firms formulated business policies that were 'less rational than policies pursued by professional management'. Both organisations adopted the 'optimal' policies for their business. Thus in comparing the differences in industrial development between Britain and Japan, Church asserted that:

> families in different cultures adopted different priorities for reasons which did not stem, almost deterministically, from the structure of their businesses. Business strategies owed more to the contrasting cultural environments which prompted divergent assumptions, aspirations, and the adoption of criteria by owners and managers nurtured within different societies.[38]

In arguing this case, Church revised the role of the family firm by presenting a model which analysed the external issues which may have shaped the development and organisation of a firm.

The final theme which the thesis will investigate is the debate concerning the production practices of British firms between 1895-1939. The debate surrounding production practices in British industry has been dominated by the model of industrial decline offered by Elbaum and Lazonick. Both historians identified four characteristics of British industrial organisation which rendered it incapable of competing with foreign competition. First, firms were highly competitive and lacked market power. Second, British firms were relatively small compared to their foreign counterparts. Third, there was very little vertical integration and consequently British industry

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[37] *Ibid*, p. 33.
[38] *Ibid*, p. 36.

retained its atomistic structure. Fourth, this structure had a negative affect on attempts within British industry to initiate mass production and standardization practices. Although America possessed similar characteristics during the nineteenth century, it had by the late nineteenth and early twentieth centuries, transformed into a corporate economy that met the needs of mass production. In contrast, Britain was unable to emulate the American experience due to rigidities which existed in its economic and social institutions. Thus Lazonick and Elbaum have asserted that:

> Britain's distinctiveness derived less from the conservatism of its cultural values *per se* than from a matrix of rigid institutional structures that re-inforced these values and obstructed individualistic as well as collective efforts at economic renovation.

They maintain that entrenched institutional structures in enterprise and market organization, education, finance, international trade and state-enterprise relations 'constrained the transformation of Britain's productive system'.[39]

Although Elbaum and Lazonick used the traditional British industries of cotton and steel to demonstrate how institutional rigidities of the nineteenth century retarded economic advancement in the twentieth century, Lewchuck suggests that the 'new industries' were equally affected. Lewchuck's study contrasts the more 'efficient' integrated productive process of the American motor industry, with the more dis-integrated 'atomonic' units of production which characterised the British car industry. Certainly British car makers utilised the car component sector to a far larger extent than their American

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[39] Elbaum and Lazonick, 'An Institutional Perspective', p. 2.

counterparts. Indeed, the assemblers' preference to perpetuate a dis-integrated productive process has been interpreted as an institutional rigidity that retarded the motor industry during the interwar period.[40] Lewchu k's dissatisfaction with the organisation of Britain's motor industry stemmed from the belief that had British manufacturers adopted an integrated system incorporating mass production techniques, then a market large enough to enable producers to achieve economies of scale would have been created. According to Lewchu k, supply factors were paramount.

Despite the model's persuasive account of Britain's industrial decline, a number of historians have questioned some of its underlying assumptions. Most recently, Kirby has suggested that the model offers only deterministic explanations of economic decline. Thus, once the economy is locked by historical circumstances into a particular industrial structure, decline becomes inevitable. With these pre-conceptions at the heart of Lazonick and Elbaum's analysis, Kirby has suggested that the authors over-look significant technical and productive progress:

> The First World War stimulated rapid technical progress in existing industries-in shipbuilding, general engineering, and steel production - and was responsible for the extensive manufacture in Britain for the first time of a number of advanced products such as motor vehicles, aircraft, light machine tools, chemicals, magnetos and ball bearings.

Kirby also maintained that the war initiated changes in production techniques which placed more emphasis on repetitive

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[40] For a useful critique of such interpretations see M.W. Kirby, 'Institutional Rigidities and Economic Decline: Reflections on the British Experience', *Economic History Review*, 65, (1992).

standardized production processes.[41] Finally, Kirby challenged the assumption that twentieth century industry inherited nineteenth century market structures. He argued that, far from continuing in the free market tradition, many industries entered into collusive agreements, to the detriment of their productive efficiency. Kirby cited the increased cartelization , especially in the context of tariffs and imperial preference during the 1930s, as evidence of this process.[42]

Another study which challenged some of the fundamental concepts contained in the Elbaum and Lazonick model is that of Langlois and Robertson. They analysed the process of backward integration within the American motor car industry and concluded that an integrated productive process (a central feature in Elbaum and Lazonick's modern industrial economy) cannot be regarded as an inherently efficient policy. In contrast to Lazonick and Elbaum, they analysed the car industry's relation to *market demand* and suggested that during the 1920s and 1930s, the US used car market opened competition that car makers had not previously faced. The car makers' response was to implement annual model changes, a policy which was difficult to implement with a fully integrated production process. Consequently, whilst Ford experienced great difficulties in changing from the model T to the model A in the 1920s it was:

> the small, less integrated firms, who were best able initially to succeed in the era of replacement demand...for example...Chrysler's strategy of design flexibility and shallow vertical integration proved very successful in the

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[41] Kirby, Institutional Rigidities', p. 650.
[42] *Ibid*, p. 655.

> pre-war period when the rate of technological change in the product was rapid.[43]

Therefore, Langlois and Robertson cast doubt upon the validity of one of the central concepts present in the institutional rigidity model, that backward integration was necessary for a modern and efficient productive process.

The need to safeguard more flexible production techniques was even more pronounced in Britain where the domestic market lacked social depth. Indeed, in a recent survey of the motor industry, Church has asserted that British firms adopted the optimum production techniques (1994). Church attributes Ford's failure in Britain during the 1920s and 1930s to the inflexibility of its productive process due to its inability to accommodate 'British customer's preferences regarding performance, road holding, running costs, appearance and a basic degree of comfort'.[44] He argued that assemblers were able to accommodate British tastes by neither investing in automatic machinery or producing a standardized output. In order to accommodate frequent model changes, Church asserted that:

> Both Morris and, to a lesser extent, Austin opted for the flexibility offered by a low level of integration, purchasing a high proportion of parts and components from outside suppliers for assembly at Cowley and Longbridge.[45]

Church, then, has been instrumental in questioning whether the model of industrial decline, (which draws heavily from the American experience), presented by Lazonick, Elbaum and

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[43] R.N. Langlois and P.L. Robertson, 'Explaining Vertical Integration: Lessons from the American Automobile Industry', *Journal of Economic History*, 49, (1989), p. 370.
[44] R. Church, *The Rise and Decline of the British Motor Industry*, (1994), p. 34.
[45] *Ibid*, p. 35.

Lewchuck, is relevant to the economic and social structure of Britain between 1895-1939.[46]

Conclusion

Through the analysis of the secondary source material, it is clear that an investigation into the Coventry car component industry would make a significant contribution to the history of the motor industry and business history generally. First, previous historians of the motor industry have neglected not only the car component industry but the implications that a low integrated industrial structure had upon motor car manufacture. Evidently, an analysis of the structure and development of the component industry will provide an insight into how a new light industry emerged in Britain between 1895-1939 and the extent to which the organisation of the component industry affected the production strategies pursued by car assemblers. Second, the literature review of current themes in business history has revealed important issues which the thesis will address. Thus although the thesis is based on archival evidence, the study will not be archive driven. By implementing a thematic approach and placing the evidence within appropriate analytical frameworks, issues such as the circumstances surrounding an industry's inception, the ownership and finance of firms, and the organisation of British firms will be examined. Thus the following seven chapters will address significant themes in

[46] Likewise, Supple (1991) challenged the assumption that the American model of backward integration should be used as a standard against which to assess the structural characteristics of business systems in other countries. See Supple, 'Scale and Scope', p. 513.

business history in order that conclusions can be drawn from both the car component industry and on the nature of the car industry in Britain between 1895-1939.

Chapter 2

The British Motor Industry 1896-1939: A National Perspective

This chapter will analyse the origins and growth of the British motor industry between 1870-1939. The objective is to provide a background to the structural development of the industry by examining the significance of the industries which preceded the motor firms, the geographical location of the industry, and the level of output attained by firms throughout the period under study. The chapter also places in context the role played by Coventry in the birth and subsequent growth of the industry. Thus the number and size of car and component firms in the city is contrasted with the concentration of firms in other engineering districts of Britain.

The Origins of the British Motor Industry 1870-1914

Only after experiments with cars had taken place in Germany in 1886 and France in 1895 did a motor industry emerge in Britain during the mid to late 1890s.[1] One explanation for Britain's delayed entry into motor vehicle production was the success of its light engineering sector during the late nineteenth century. The experimental nature of the motor industry created an uncertainty and consequently established engineering firms were reluctant to diversify from a successful engineering sector. The basis of Britain's light engineering success lay initially in the machine tool trade. Indeed, during the late nineteenth century there was a rapid development in machine tool manufacture which had a significant affect on the rest of the

[1] T. Barker, *The Economic and Social Effects of Motor Vehicles*, (1987), p. 1.

engineering industry.

In the late nineteenth century machine tool manufacturers spread in areas associated with locomotive production, textile machinery manufacture and cycle making. A report on the Vienna Exhibition in 1873 commented that 'the workshops of certain leading firms in England are being filled with tools of a certain kind, possessing great originality with regard to fitness for a purpose in the manufacture of general machinery, agricultural engines, small arms etc.' However, the production of these items required a high degree of specialization and consequently tools were manufactured in small batches for a specialized purpose.[2] The geographical location for the vast majority of these firms was the West Midlands where there existed, in Birmingham, a long-established iron and metal working sector and, in Coventry, a textile and cycle making base. Although the region's isolation from the sea barred the development of an extensive heavy engineering industry, the access to coal and iron, the extensive reserve of skilled labour and the continuance of the small scale metal industries invited the expansion of light engineering.[3] One of the pioneering machine tool firms in the area was the Coventry firm, Willdig and Hatton which was established in 1859 to make drilling machines for textile machinery. Early entrants into the industry included Webster and Bennett, founded in 1887, and E.S. Brett which was established in 1892.[4] Despite the specialised nature

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[2] S.B. Saul, 'The Market and Development of the Mechanical Engineering Industries in Britain 1860-1914', *Economic History Review*, (1967), p. 125.

[3] C.H. Lee, *Regional Economic Growth in the United Kingdom Since the 1880s*, (1971), p. 85.

[4] *Victoria County History: Warwickshire*, (Birmingham, 1962) p. 187.

of machine tool manufacture, large businesses did emerge. For example, by 1914 the Coventry firm Alfred Herbert, which was established in 1888, was almost three times the size of any other machine tool manufacturer in the country employing over 2,000 workers.[5] The growth of machine tool manufacture in the West Midlands encouraged not only an expansion of the cycle industry but also provided an attractive site for the advent and development of the motor industry.

The origins of the cycle industry can be traced to the Coventry Sewing Machine Company which extended its production to cycles in 1868. The firm had originally been sited in Coventry as a replacement for the declining ribbon trade and also to utilise the host of machine tool firms which had serviced the textile machinery. Although Coventry remained at the heart of the industry, the cycle trade rapidly spread to Birmingham, Wolverhampton and Nottingham. Table 2.1 shows the rapid growth of the industry and significance of Coventry and of the West Midlands for the years 1881 and 1891.

Table 2.1

The Number of Cycle Firms in the West Midlands 1881 and 1891

Town	1881 No of Firms	% of Firms National Industry	1891 No of Firms	% of Firms National Industry
Coventry	400	57	4,100	49.4
Bir'ham	-	-	2,600	31.3
Wolv'ton	300	43	600	7.2

*Source: P. McLeay, 'The Wolverhampton Motor Car Industry 1896-1937', **West Midland Studies**,* (1969), p. 100.

Thus by 1891, almost 90% of the cycles produced in Britain emanated from the West Midlands. Furthermore, a cycle boom occurred in the mid-1890s when an upsurge in demand led to manufacturers producing large volumes of cycles by assembling

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[5] Lee, *Regional Economic Growth*, p. 85.

bought-out components. This development added to the growth of the industry by encouraging a large number of firms to enter the cycle component industry especially in Coventry and Birmingham. A large proportion of these cycle component firms had diversified into the industry from old-established trades. In 1896, Middlemores of Coventry, made the natural transition from making saddles and leather goods to cycle saddles and other cycle accessories.[6] Indeed, the cycle and motor industries shared similar technical objectives in relating the transmission of power to the process of movement.[7] In 1906, *The Motor* noted that 'so closely has the balance-geared axle of the tricycle maker been copied by the motor engineer that he has in many cases taken it bodily in the form used by the cycle maker'.[8] However, some firms entered the cycle industry without any previous technical connection with cycles. In these cases links did exist, even though they were not immediately obvious. For example, Thomas Warwick, umbrella maker, became a manufacturer of cycle and wheel rims, E. Payne and Company of Coventry, a cork manufacturer, entered the cycle component industry through the production of handle grips and Bluemel and Bros which made umbrellas and walking sticks, became mud guard and gear case producers. Indeed, Bluemel was a good example of how firms were able to transfer technology from their original and unrelated trade and apply it to the cycle industry. Bluemel, which had been attracted to Coventry from London during the late 1890s due to the boom in the cycle trade, used its

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[6] D. Thoms and T. Donnelly, *The Motor Car Industry in Coventry Since the 1890s*, (1985), p. 20.
[7] *The Motor*, 30 January 1906, p. 734.
[8] *The Motor*, 27 February 1906, p. 94.

experience of producing celluloid handles for walking sticks to manufacture the first celluloid cycle components in Britain.[9]

Related to the growth of the machine tool and cycle trades was the development of motor car production. Consequently, the geographical location of the industry was largely based in the West Midlands. Indeed, S.B. Saul noted that:

> the car industry concentrated in the Midlands, largely because either the firms themselves or their progenitors grew up in those trades which created the new industrial area in the second half of the nineteenth century. The environment was on more naturally suited the manufacture of cars and above all their component parts than that of the heavy engineering trades of the North.[10]

The first motor company to be established in Britain was the British Motor Syndicate which was publicly floated by Harry Lawson in 1896. The highly publicised floatation of the Coventry based firm ensured that the city attracted a number of important car assemblers and component makers during the formative years of the motor industry. Lawson's attraction to Coventry was twofold. First, he had strong connections with the city's business community after promoting a number of cycle firms during the early 1890s. Second, Lawson exploited another legacy from Coventry's industrial past by utilising a disused textile factory to house the British Motor Syndicate.[11] Although the advent of the motor industry in Britain can be traced to the establishment of the British Motor Syndicate, the growth of the industry did not become fully established until after the mid-

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[9] A.E. Harrison, 'The Origins and the Growth of the UK Cycle Industry to 1900', *Journal of Transport History*, 6, (1985) p. 52. *Coventry Standard*, 7 March 1952, p. 7.

[10] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, (1962), p. 30.

[11] Thoms and Donnelly, *The Motor Car Industry*, pp. 36-39.

1890s cycle boom. The collapse of the cycle trade during the late 1890s forced many cycle firms to search for new product outlets. Firms which were to become established marques in the motor industry such as Rover, Riley, Singer, and Humber all had origins in the Coventry cycle industry, whilst William Morris began his business interests by establishing a cycle shop in Oxford. Although Coventry harboured the first few firms at the advent of the motor industry, there were a number of other areas where the motor industry began to concentrate. The Wolseley sheep sheering machinery business in Birmingham transferred over to car production, whilst Calthorpe Motors was established in the city at the turn of the century. After the West Midlands, the main concentration of car makers was the south east. C.H. Lee has suggested that the reasons for growth of the motor industry in this area were due to 'the prior existence of a highly diverse engineering industry, as in the case of the West Midlands, plus the fact that, geographically, London was the location most open to the influence of French and organizational advancement in the industry at the time'.[12] Between 1903-1905, Vauxhall's marine engineers made vehicles in Lambeth before moving to Luton, while a host of small car firms were founded in Lambeth, Pimlico, and Fulham. By 1911, London and Middlesex contained 25 per cent of motor car and mechanics in England and Wales. During these formative years of the motor industry there was also a concentration of car makers in the North. A number of important car manufacturers were cited in Manchester during the early 1900s such as Crossley Motors and Bellsize Motors. The early success of these firms almost

[12] Lee, *Regional Economic Growth*, p. 102.

certainly encouraged Ford to site its first factory in Britain at Trafford Park Manchester in 1911.[13] Further north in Scotland, some 51 firms began producing vehicles between 1900-1925. However, three firms dominated the Scottish industry during this period, Albion, Arrol Johnston and Argyll, which was one of the largest manufacturers in Europe. In 1907, Scotland was producing 11 per cent of the UK's vehicle output, but by 1913, the figure had dropped to 7 per cent. This decline continued through the interwar period since, by 1930, only one firm of any significance had survived.[14]

The output of cars to 1914 was often small and subject to yearly variation. In 1913, out of the 29 firms which recorded output totals, only eleven produced over 1,000 cars. Moreover, only three firms, Ford (6,139), Humber (2,500) and Wolseley (3,000), surpassed the 2,000 mark.[15] Significantly, the two largest producers, Ford and Wolseley were not based in Coventry, although it has been estimated that over 9,000 cars were built in the city in 1913, compared to 5,000 in Birmingham and 3,000 in Wolverhampton. Thus it was that by 1914, the motor industry was one of comparatively small units of production, a characteristic which was to continue in Coventry throughout the interwar period.[16] Only Singer, which had marketed its first car in 1905, was a firm of any great size since it was considered the third largest car producer in Britain until the late 1920s.[17] However, during this early period, the focal

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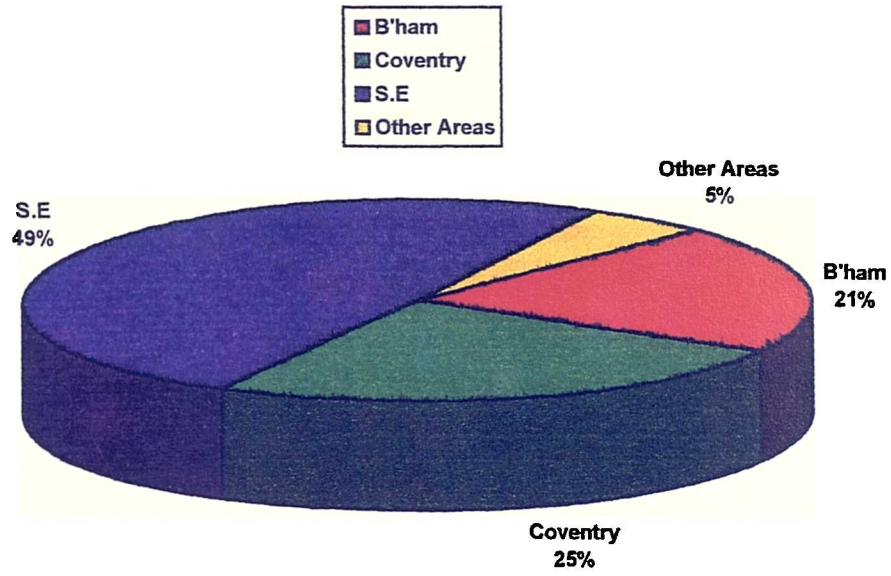
[13] A.D. George, 'The Manchester Motor Industry 1900-1938', Manchester Polytechnic (Occasional Paper no. 3, September 1981).
[14] S. McKinstry, 'Financial Management in the Early Scottish Motor Industry', *Accounting, Business and Financial History*, 3, (1993), p. 277.
[15] Saul, 'The Motor Industry', p. 24.
[16] *Victoria County History*, p. 181.
[17] K. Richardson, *The British Motor Industry 1896-1939. A Social and*

point of the industry was undoubtedly Coventry since, during the late 1890s, all of the firms working on continental patents were located in the city. By 1911, Coventry possessed 6,838 workers engaged in motor car production, which represented nearly one-third of the personnel employed in the West Midlands and 14 per cent of those employed in Britain. This compared to 5,400 workers in Birmingham, 1,300 in Wolverhampton, and some 2,800 scattered in Worcestershire, Staffordshire, and Warwickshire.[18]

Chart 2.2

The Location of the British Car Component Industry in 1914



*Source: D.R. Littlewood, 'The Location of the British Car Industry 1888-1940', (unpublished MA Thesis, 1962), **Victoria County History**, Warwickshire, (1968), p. 188, Appendix 1 (List of Coventry Car Component Makers 1902-1936).*

Coventry's leading position in the motor industry between 1896-1914, was confirmed by the large number of component firms which had been established in the city. Figure 2.2 shows that by

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Economic History, (1977), p. 110.

[18] *Victoria County History*, p. 180.

1912, Coventry possessed approximately 25 per cent, of the total number of car component makers in Britain, a figure which placed it in front of Birmingham which had 21 per cent and behind the south east with 49 per cent of firms. Significantly, very few component suppliers were established in the North of England and Scotland since these areas were mostly concerned with heavy industry and producing raw materials for the industry.[19] Moreover, the North's largest car producer, Ford of Manchester, imported kits of cars from the US, thereby making minimal use of local component suppliers.[20] However, the West Midlands' strong links with the cycle industry provided fertile ground for the growth of the component industry. Many of the cycle component makers, after the collapse of their trade in the late 1890s, diversified into car component production. For example, Allday and Onions and Joseph Sankey, both of Birmingham had entered the component industry by the turn of the century. Likewise, Birmingham based Joseph Lucas, which was to become the largest component supplier in Britain by 1939, diversified from producing cycle to car components with minimal difficulty. By the 1910 Olympia Motor Show, Lucas was already exhibiting a complete electric lighting system for motor vehicles.[21] Although the south east did not possess links with the cycle industry, a number of significant component suppliers emerged at this time. In the electrical branch of the trade, Smith and Sons, Simms and Company, and the Chloride Company became important suppliers of gauges, accumulators

[19] D.R. Littlewood, 'The Location of the British Car Industry 1888-1940' (unpublished MA thesis, University of Leicester, 1962), p. 27.
[20] R. Church, *The Rise and Decline of the British Motor Industry*, (1994), p. 5.
[21] Richardson, *The British Motor Industry*, p. 91.

and batteries for the motor industry. Whilst Simms established his business with the objective of supplying the motor industry, Smith's and Chloride existed before the car had been invented. Smith's had been founded in 1851 as clockmakers at Newington Causeway in London. In 1904 the business diversified into car components by opening a department to make 'motor watches'. After taking over Goldenlyte, a car head-lamp firm, in 1908, and the car starting business of Trier and Martin in 1913, Smith's were able to produce a whole range of motor vehicle electrical equipment.[22] The Chloride Company was established in Britain in 1891 to produce batteries for Britain and the Empire using American patents. At this stage, the batteries were designed for static use in industrial and domestic lighting, but they were soon converted to act as a power source for marine vehicles and cars. By 1914 Chloride was the principal supplier of motor batteries, a position which was strengthened after the war by taking over numerous smaller competitors and winning key contracts with Ford and Vauxhall.

The British Motor Industry 1914-1939.

Although the manufacture of cars and components continued to be concentrated in the West Midlands and the south east, the motor industry under went radical structural change between 1914-1939. Since the First World War limited the resources available for the construction of private cars, the British motor industry transferred its productive capabilities to military products. For example, Daimler manufactured tractors,

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[22] M. Adeney, *The Motor Makers. The Turbulent History of Britain's Car Industry*, (1988), p. 156.

ambulances, lorries and buses, whilst Standard and Riley devoted their resources to the manufacture of aircraft.[23] However, although the war checked the expansion of the domestic car industry, the repetitive production techniques employed, increased the potential capacity to manufacture vehicles. Nevertheless the most significant war time event was the imposition in 1915 of the McKenna duty which placed a $33^{1}/_{3}$ per cent tax in the landed cost of imported components and cars. Apart from a brief interruption in 1924-1925, the duties were retained for almost 50 years, a factor which ensured that the domestic car market was dominated by British based manufacturers.[24]

In the years that directly followed the First World War, the British motor industry expanded due to an increase in new firms and the enlargement of existing car firms. The high demand for cars after the war created boom conditions within the industry, and at least twelve new car firms were founded in Coventry alone between 1919-1926. Chart 2.3 shows that the trends in Coventry were mirrored nationally, with a large rise in car firms recorded between 1918-1921.

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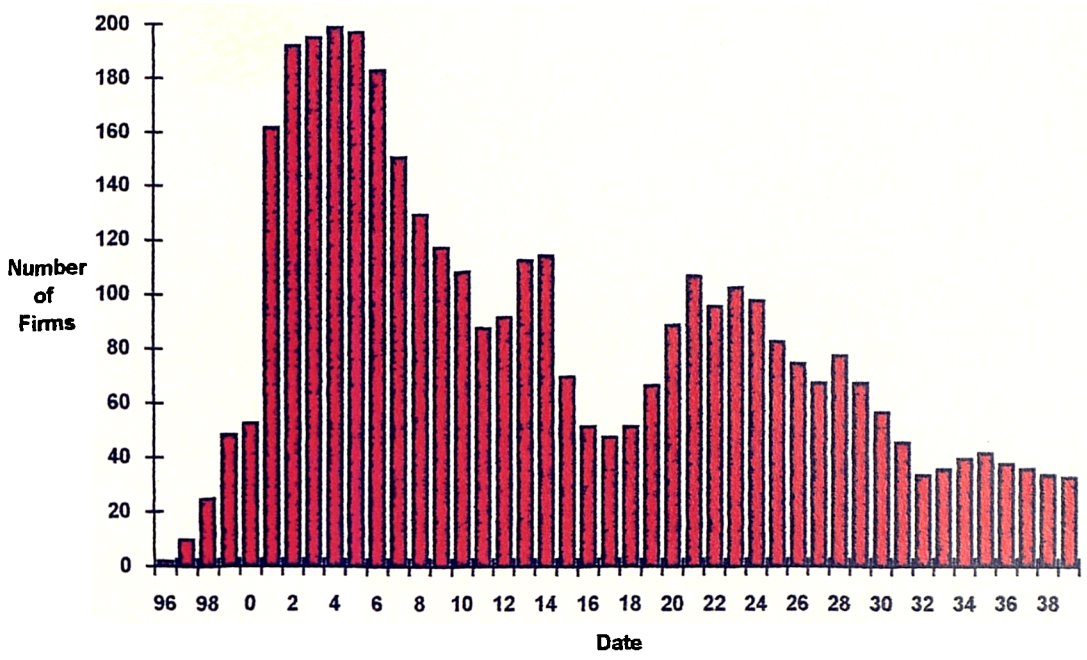
[23] *Victoria County History*, p. 182.
[24] R. Church, *The Rise and Decline of the British Motor Industry*, (1994) p. 12.

Chart 2.3

The Number of British Car Manufacturers 1896-1939



*Sources: D.G. Rhys, 'Concentration in the Inter-War Motor Industry', **The Journal of Transport History**, 3, 1976, Thoms and Donnelly, **The Motor Industry in Coventry Since the 1890s**, (1985), S.B. Saul, 'The Motor industry in Britain to 1914', **Business History**, 5, (1962). NB. Due to the high turn-over rate of firms in the motor industry, this table should not be considered a definitive assessment of the firms producing cars during this period. However, the table does provide a useful guide to the exit and entry trends within the industry.*

Chart 2.3 provides an indication of the structural changes that took place in the motor industry between 1896-1939. The high turn over of firms, which was a feature of the industry's early years, continued into the 1920s. Between 1920-1929 over 80 car firms ceased to manufacture cars.[25] Moreover, the 1920s, was the period which saw the last large entry of firms into the industry and consequently, the total number of firms in Britain was never to exceed 100 again. However, despite the high number of exits and entries into the motor industry, the 1920s and 1930s was a period of increasing concentration in which a

[25] *Victoria County History*, p. 183.

handful of firms began to produce cars in volume. In 1929, it was estimated that three British manufacturers shared some 75 per cent of the British production of cars. Oxford based Morris accounted for 35 per cent of the market (63,000), Austin of Birmingham took 30 per cent (46,000), whilst Singers of Coventry possessed 15 per cent of the market (28,000). Significantly, Ford slipped from its pre-war dominance to fourth position with a market share of only 4 per cent. (7,000)[26]. Further structural change occurred during the 1930s when there was an increase in firms entering the volume production market. By 1939, 90 per cent of car production was in the hands of the 'Big Six', Morris, Austin, Vauxhall, Rootes, Ford, and Standard. Another 8 per cent of output emanated from Rover, Singer, Jaguar and BSA. Thus, the period 1929 to 1939 witnessed a change in the relative importance of different firms. In 1932, Ford re-located to a new purpose built plant in Dagenham to take advantage of the facilities offered for shipping raw materials into the factory and completed cars out to the export markets. Although Ford did improve its sales position, the new facilities proved more beneficial to its export markets.[27] A more substantial improvement in output was experienced by Vauxhall. In 1928, the small ailing producer of quality cars was taken over by the American firm General Motors. Through the financial backing of General Motors, which was able to build up their subsidiary's capital equipment, re-organise the production lines, introduce intensive marketing techniques and inject technical expertise and design innovations, Vauxhall made the leap from

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[26] G. Maxcy, 'The Motor Industry', in P.L. Cook, *The Effects of Mergers*, (1958), p. 367.
[27] D.G. Rhys, *The Motor Industry. An Economic Survey*, (1972), p. 13.

small scale to volume producer. Thus from possessing only 0.75 per cent of British car output in 1929, Vauxhall had increased the figure to 9.4 per cent by 1939.[28] Standard and Rootes also joined the volume producers during this period, Standard through the re-organisation of the production process under the management of Captain Black, and Rootes which entered the market through the purchase of Humber and Hillman in 1932.[29] In 1931, Standard's assembly shop at Canley had been re-organized and mechanized to facilitate volume production. By October 1932, sales had increased by 80 per cent on the previous year, trebling profits for the firm. Indeed, Standard's success in entering the volume production market is demonstrated by the increase in output that had been achieved by the outbreak of the Second World War. Thus in an eight year span, production increased from 8,000 vehicles in 1931 to 55,000 in 1939.[30] Although, Rootes initially entered the mass market through merger, they too re-organised the productive process. By integrating their existing firms with Humber and Hillman, Rootes were able to achieve a degree of standardizarion and interchangeability, a factor which helped increase production by nearly sixfold.[31]

Another important development of the motor industry during the 1930s was the nature of competition between firms. Although competition by variety had always been a feature of the British motor industry prior to the 1930s, the practice of

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[28] L. Holden, 'A History of Vauxhall Motors to 1956: Industry, Development and Local Impact on the Luton Economy', (unpublished MPhil Thesis, Open University, 1984), pp.50-51

[29] J. Bullock, *The Rootes Brothers. Story of a Motoring Empire*, (1993), p. 40

[30] Thoms and Donnelly, *The Motor Car Industry*, pp. 97-98.

[31] Maxcy, 'The Motor Industry', p. 374.

increasing the number of models available was accentuated during this period. In 1933, *The Economist* noted that:

> The number of models in production of the ten largest manufacturing groups, controlling over 90 per cent of the market, increased from 46 in 1929-30 to 55 in 1931-2, 60 in 1932-3, and 64 in 1933-4. The old game continues- everybody to catch the public's fancy with at least one of their range of models.[32]

This trend continued after 1933 and consequently, by the 1939, the variety of models produced had further increased. Indeed, the most successful car assemblers during this period were the firms that adopted a flexible production system that could meet the persistent British consumer demand for quality and differentiation.[33] Thus, a low integrated productive system, which had characterised Britain's car industry between 1912-1929, continued to be the optimum production strategy through into the 1930s.

It was during the interwar period that Coventry's position as the focal point of the motor industry altered. With both volume producers, Morris[34] and Austin, located outside of Coventry, the city became associated with relatively small firms producing medium priced or luxury cars. Coventry firms such as Rover, Alvis, Lea Francis, SS Cars (later Jaguar) and Riley had all established themselves in the medium to luxury market by 1935. Although volume production was carried out at Coventry's largest firms, Standard and Rootes, these two firms only represented approximately 10 per cent of the total car

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[32] Quoted in G. Maxcy and A. Silberton, *The British Motor Industry*, (1959) p. 15.
[33] Church, 'The Rise and Fall' ,p 37.
[34] R.C. Whiting, *The View from Cowley. The Impact of Industrialisation Upon Oxford 1918-1938*, (Oxford, 1983).

production for 1939.[35] Although at one time Singer appeared to be establishing itself as a major volume producer, by the 1930s it had diversified into the quality market. Despite a fresh capital injection in 1936 after being on the verge of bankruptcy, Singer failed to regain its place in the 'Big Six' car manufacturers.[36] Coventry's failure to realise its pre-war potential due to the preponderance of small scale firms was reflected in the employment statistics for the period. In 1921, 18,692 Coventry workers were engaged in the manufacture of cycles and motor vehicles which represented approximately 9 per cent of the total employed in the country. Thus the number employed in Coventry in relation to the total employed in the motor industry had fallen by 5 per cent from the 1911 figure. In contrast, Birmingham increased its national average by 5 per cent and accommodated 28,863 workers (14 per cent.) whilst Wolverhampton possessed 6,252 working in the motor and related industries (3 per cent). Although these figures did not alter dramatically over the next ten years, they indicated that Birmingham and Oxford, largely through the firms such as Austin and Morris, had become the focal points for volume production in the car industry by 1930.[37]

The trend of locating volume production factories outside of Coventry was also reflected in the changing structure of the component industry. Figure 2.4 shows that due to an increasing tendency for component firms to locate outside the traditional supply areas, Birmingham, Coventry and the south east, all experienced a fall in their percentage of the national share.

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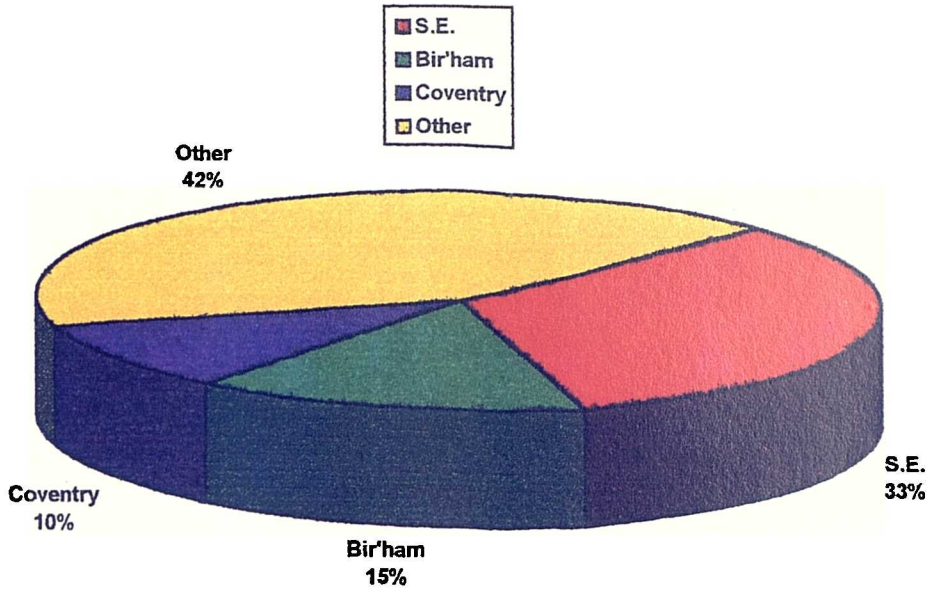
[35] Thoms and Donnelly, *The Motor Industry*, p. 85.
[36] *Ibid*, pp. 90-91.
[37] *Victoria County History*, p. 184.

Figure 2.4

The Location of the British Car Component Industry 1939



*Source: D.R. Littlewood, 'The Location of the British Car Industry 1888-1940', (unpublished MA Thesis, 1962), **Victoria County History**, Warwickshire, (1968), p. 188, Appendix 1 (List of Coventry Car Component Makers 1902-1936).*

By 1939, approximately 10 per cent of British car component firms were located in Coventry, a figure which represented a 15 per cent drop from its 1914 position. This compared to Birmingham which housed 15 per cent of component firms and the south east which possessed 33 per cent. Moreover, not only did Coventry slip behind Birmingham in the ranking of leading component suppliers but also, as in car assembly, Coventry continued to be associated with the small to medium sized component firm.[38] In a similar manner to that of the car assemblers, a number of volume producing firms began to dominate the component industry. In 1935, *The Economist* noted that:

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[38] See Littlewood, 'The Location of the British Car Industry', p. 60 and Appendix I.

> The motor accessory trade like the motor industry itself, appears to be attaining its commercial majority...The boom of the late 'twenties had multiplied the accessory manufacturers...highly competitive conditions resulted, in which the ranks of the accessory makers were noticeably thinned.

The Economist concluded that the main beneficiaries of these conditions were the large component suppliers since the high-turn over of small firms suggested that they were unable to withstand the fluctuations in demand that occurred during the late 1920s and 1930s.[39] Of the large component firms which emerged during this period such as Dunlop, Lucas, Triplex Glass, Pressed Steel, Briggs Motor Bodies, Smith and Sons and Chloride, not one possessed their head office in Coventry. Indeed, Dunlop was the only firm to possess a subsidiary (Dunlop Rim and Wheel) in the city. However, Coventry still retained a significant position in the component industry as the city still housed a high number of firms which supplied the medium and luxury car makers or acted as secondary suppliers to the volume producers. Moreover, the Coventry firm represented the typical British component firm, since although a handful of large firms held a pivotal position in the trade, the industry as a whole was derived from hundreds of independent small scale units of production. Indeed, the survival and importance of the small component firm was to continue into the post Second World War period. In 1962, a British Motor Corporation executive commenting on the important role of the small component firm noted that 'when their efforts are added together, the small firms contribute a great deal more. Many are

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[39] *The Economist*, 26 October, 1935, p. 814.

companies which the public have never heard of-and yet without them empires like our own could be in serious difficulty'.[40]

Conclusion

This chapter has identified and analysed the origins and subsequent growth of the British motor industry between 1870-1939. The structures of the car and component industries closely mirrored one another, since both recorded a high level of turn-over of firms. Moreover, although the entry and exit barriers remained fairly low throughout the period under study, both sectors had experienced a concentration of large dominant firms by the 1930s. Significantly, the concentration of powerful car assemblers and component makers occurred largely outside of Coventry. Thus from becoming the focal point in the formation of the British car and component industries, Coventry began to play a more specialised, yet still significant, role in the development of the motor industry. Indeed, after the First World War the city became associated with a myriad of small car and component firms that operated to small scale scales of production. However, although the component industry was dominated by a handful of powerful firms, Coventry reflected a key characteristic of the British component industry since it was derived from hundreds of small scale firms. Since historians have had a tendency to analyse the large and prominent firms, the small to medium component firm has received scant attention. The following chapters will analyse the archival evidence relating to the Coventry car component industry to

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[40] G. Turner, *The Motor Makers*, (1962), p. 52.

establish the structure, development of the industry and the key role it played in the British motor industry between 1895-1939.

Chapter 3

Coventry Component Firms: Exit and Entry and the Competitive Structure of the Industry

This chapter analyses the circumstances surrounding the entry and departure of firms in the Coventry car component industry between 1895-1939. Whilst entry to the industry will be defined as occurring when a firm embarks on the production of car components for assemblers, the circumstances surrounding a firm's exit is a little more complex. In analysing the exit of firms, this chapter will only include concerns which ceased making components through either business failure or a firm's diversification from car components to other products. Consequently, the take-over of component firms by either larger competitors or assemblers, unless it led to product diversification or the direct closure of the supplier, will not constitute an exit from the industry.

By using this criterion to analyse the pattern of entries and exits in the component industry, the chapter will explore the competitiveness of the industry through Hirschman's 'Exit, Voice and Loyalty' model.[1] The model offers an alternative to the simple exit of firms from an industry by analysing the 'voice' option, whereby a firm's customers, or financial backer 'loyally' intervene to ensure that the firm staves off liquidation. Foreman-Peck has applied this concept to the car industry and concluded that banks and large suppliers 'played a significant part in the shaping of industrial structure at least in the motor

[1] For further information on the mechanics of this model see chapter one.

industry, though not a beneficial one in the long run'.[2] However, Foreman-Peck's evidence does not shed light on the extent to which the voice option was utilised in the component industry since intrinsically linked to the exit or voice options was the nature of the market in which these decisions were made. Thus an assembler was more likely to show loyalty to a supplier and save it from liquidation if there was a deficiency in competitive component makers on the market. Conversely, an assembler that used suppliers from a highly competitive market would, if one of their component suppliers was experiencing financial difficulty, transfer their orders to a competitor. However, each branch of the component trade was influenced by a number of different variables which shaped their particular market. Therefore, where possible, this chapter will examine the added pressures exerted on component firms by the competition they faced within their own sector, factors which may have influenced a firm's entry into or exit from the motor industry.

The Structure of the Coventry Car Component Industry 1895-1939

Table 3.1 provides an useful insight into the number of Coventry car component firms between 1902-1936. However, since the table was constructed through the use of trade directories, it is little more than a 'snap shot' of the car component firms operating for the years shown. Also the years chosen to create a data base of component firms were, to some

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[2] J. Foreman-Peck, 'Exit Voice and Loyalty as Responses to Decline: The Rover Company in the Interwar Years', *Business History*, 23, (1981), p. 191, 205.

extent, dictated by the availability of surviving directories. For example, although the data collected for the years 1902, 1908,

Table 3.1
The Number of firms in the Coventry Car Component Industry for selected years between 1902-1936.

Date	1902	1908	1912	1919	1926	1936
No of Firms	28	38	61	78	80	62

Sources: Kelly's Directory of Warwickshire 1902-1936, Ryland's Directory of Iron, Steel and Allied Trades 1902-1936, Spennell's Directory for the City of Coventry 1919, Directory for the City of Coventry 1936. Motor Manufactures of Coventry (Museum of British Road Transport).

1912, 1919, 1926, 1936, provide an effective framework from which to demonstrate the changing pattern of the component industry, these particular years also offered the most accurate and comprehensive information on the Coventry component industry. While trade directories are a useful guide to the size of the industry, they also present a number of problems. Although it is clear that some firms were producing car components prior to 1902, the trade directories do not recognise these firms as manufacturing within an identifiable industry. Consequently, early car component firms were listed under Coventry's traditional industries such as the cycle, watch and coach trades.

However, as table 3.1 shows, by 1902 an identifiable car component sector had emerged. The industry grew steadily until the years 1908-1912, when it almost doubled in size, the largest increase of firms the component trade ever experienced.[3] Between 1912-1926, the industry gradually increased in size, until 1936 when the number of car component firms began to

[3] During this period Coventry component firms accounted for approximately 25 per cent of the total component firms in Britain. See chapter 2, chart 2.2.

decline. Significantly by 1939, Coventry had lost its position as a leading car component supplies centre.[4] Indeed, the table implies that after 1919 the industry progressed to a period of relative stability or even stagnation. However, although the table may provide a useful insight into the fluctuation of firms, the information can not be regarded as a useful guide to the size and importance of firms or the stability of the component industry. Only through the analysis of the entry and exit of firms and the markets in which various branches of the component trade were operating, will the industry's changing structure be examined effectively.

The Emergence of the Coventry Car Component Trade: The Formative Years 1895-1912

Table 3.2 shows that between 1902-1912, the component industry possessed particular growth areas. For example, of the thirty-six firms which entered the industry, almost two thirds began manufacturing bodies and engines. The third largest group was the electrical sector which attracted five firms during this period. In contrast, castings, stampings, radiators, tyres and wheels, all recorded low levels of entrants. Perhaps the most striking feature between 1902-1912 was the relatively small number of firms leaving the industry. Unlike the motor car industry, in which this period witnessed high levels of entries and exits, the component industry appears to have experienced very few business failures at this stage. Indeed, the departure of Allard from the coach building branch was

[4] See chapter 2, chart 2.4.

Table 3.2
The Entry, Exit and Origin of Coventry Car Component Firms 1902-1912.

Product	**Entry 1902-1912**	**Origin**	**Exit 1902-1912**	**Origin**
Bodies	10	Old Est: 7 New: 3	1	Old Est: 1 New: 0
Electrical	5	Old Est: 1 New: 4	0	Old Est: 0 New: 0
Casting Stamping	1	Old Est: 0 New: 1	0	Old Est: 0 New: 0
Engines	10	Old Est: 8 New: 2	0	Old Est: 0 New: 0
Radiators	2	Old Est: 0 New: 2	0	Old Est: 0 New: 0
Tyres and Wheels	2	Old Est: 0 New: 2	1	Old Est: 1 New: 0
Other	0	0	1	Old Est: 1 New: 0
Unspec	6	Old Est: 2 New: 4	0	Old Est: 0 New: 0
Total	**36**	**Old Est: 18 New: 16**	**3**	**Old Est: 3 New: 0**

Sources: Kelly's Directory of Warwickshire 1902-1912, Ryland's Directory of Iron, Steel and Allied Trades 1902-1912, Motor Manufactures of Coventry (Museum of British Road Transport), Autocar, The Motor, Lloyds Bank Archive, Midland Bank Archive.

due to a desire to produce whole cars, rather than as a consequence of any product or financial problems.[5]

A classic characteristic of an emergent industry is that it experiences high levels of entries and exits.[6] While the car industry lends itself to this interpretation, tables 3.1 and 3.2 suggests that the same scenario cannot be attributed to the component trade between 1902-1908. Clearly, there existed between 1895-1912, some underlying factors common to most branches of the component trade which effectively created

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[5] K. Richardson, *The British Motor Industry 1896-1939. A Social and Economic History*, 1977, p. 225.
[6] M.E. Porter, *Competitive Strategy. Techniques for Analyzing Industries and Competitors*, (New York, 1980), p. 218.

barriers to entry. Only in two branches, bodies and engines, sectors not connected with the city's cycle industry, was there any substantial growth. In order to uncover the circumstances surrounding the relatively low number of entrants, the following section will examine the economic context of Coventry during the late nineteenth century to 1914 and the configuration of the early motor industry itself.

With the much publicised formation of the British Motor Syndicate in 1896, many contemporaries, expected a rapid growth of component firms. The close relationship that contemporaries predicted would exist between the cycle and prospective motor industries was demonstrated in a speech by Harry Lawson on the structure of the prospective British Motor Syndicate. Lawson believed that the organisation of the new motor industry would be almost identical to the cycle trade. He asserted that the production practices of the cycle trade, which involved many small firms buying components from suppliers, would be an integral cornerstone in the structure of the motor industry.

> Nineteen years since I went to Coventry with the present cycle...to establish an industry that has now some ninety subsidiary but important trades dependent on it. Yesterday I went to Coventry with the motor car, and I venture to say that in a very short time there will be more subsidiary trades depending on the car industry than dependent on the cycle industry.[7]

Thus, Lawson envisaged a large component sector would establish itself soon after the advent of the car industry. Certainly, the belief that the component sector would immediately generate work in allied trades was shared by the

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[7] *Autocar*, 25 April 1896, p.57

Coventry business community. The manager of the Midland Brick and Lime Works in Coventry wrote to a colleague insisting that the output of bricks should be increased to at least eighty-thousand a week to cope with prospective orders from companies associated with autocar manufacture. He predicted that over '10,000 more people will be working in Coventry in the course of a year [and] they cannot get houses to live in, it is far worse than when the boom was on before...'[8] With the establishment of the British Motor Syndicate and the success of the cycle industry in 1896, business men entered the car manufacturing industry with great optimism. The *Coventry Graphic* described 1896 as the 'signal for the starting of feverish activities in the motor business. There was no time to wait for works to be built. Everyone was anxious to "start constructing"'.[9]

However, as we have seen, a clearly identifiable car component sector did not establish itself in Coventry until some years later. The lack of a supply sector was recognised as a problem by contemporaries such as Frederick Lanchester, one of the pioneering engineers of the late nineteenth century motor industry. Recalling his early experience of the motor trade, Lanchester noted that:

> the difficulties of management were very great partly owing to the fact that no ancillary trades had been developed, and we had to do everything ourselves, chassis, magneto, wheels, body work, etc., everything except the tyres.[10]

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[8] Coventry Record Office (hereafter CRO), Acc 279/44/6253 Letter from Midland Brick and Lime Works, 1896.
[9] *Coventry Graphic*, 28 November 1913, p. 3
[10] Littlewood, 'The Location of the British Car Industry 1888-1940', 14.

There are perhaps two factors which underpin the slow development of the car component sector during the formative years of the motor industry. First, the design of motor cars in Britain had not reached a standardized pattern. Manufacturers were mostly at the experimental stage with very little output. In 1913, the *Coventry Graphic* recalled the test runs of the very early cars:

> One remembers the curious little machines that Mr Pennington used to pack as full of boys as it would hold as his test load for climbing the hill...The 'live load' enjoyed very much this method of testing the new locomotion.[11]

Such was the early variation in the design of cars that manufacturers experimented with engines under seats, single chain drives, tube ignition, short wheel bases and 'many other eccentricities'.[12] Indeed, Henry Sturmey,[13] the editor of *Autocar*, commented that 'it will be many a long day before cars are standardized and all built on the same design principle like bicycles'.[14] Thus, with very small production runs and frequent changes to design, there was virtually no market for specialist producers in the motor trade. However, the absence of a car component industry did not impose a great financial burden on car manufacturers as long as output remained small since large outlays on fixed plant and machinery were not necessary.[15]

The second factor which deterred companies from entering the component trade was the success of the cycle trade in the mid-

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[11] *Coventry Graphic*, 28 November 1913, p. 3.
[12] *Victoria County History of Warwickshire*, II, (1908), 198.
[13] For a brief account of Sturmey's activities in the motor industry see Richardson, *The British Motor Industry*, p. 13,28,192,192.
[14] University of London, Simms Papers, List A, 9/67, H. Sturmey, 'The Motor Car Industry. Why British Manufacturers have failed to make Headway', 1902c
[15] Littlewood, 'The Location of the Motor Industry', 14.

1890s. While car manufacturers attracted some new concerns, the component sector was largely derived from traditional industries. Table 3.3 demonstrates that from the sixty one component firms in 1912, at least thirty one had diversified from a trade outside of the motor industry. Consequently, it took a depression in the cycle and watch trades to encourage companies to diversify.

Table 3.3
Origins of the Car Component Firms 1912.

Cycles	17
Coach Building	8
Est as Component Firm	15
Other	6
Unknown	15
Total	**61**

Sources: *Ryland's Directory of Coventry, Kelly's Directory of Warwickshire, The Motor, Autocar* (Motor Show Editions), Lloyds Bank Archive, Midland Bank Archive, for the year 1912.

Between 1898 and 1899 the full ill effects of the boom were felt in the cycle trade. Over capitalization and a stagnant market had pushed down cycle prices resulting in the bankruptcy of many small cycle firms, while the larger concerns sustained heavy losses. In 1897, practically all of the cycle producers paid dividends, yet by 1899 many paid no dividend at all. The number of cycle firms in Coventry dropped from a peak of seventy-five in 1899 to forty-nine in 1912, only sixteen of which had survived from the nineteenth century.[16] At Dunlop's annual general meeting in 1899, it was reported that 'the cycle trade was in crisis' and, over the last few years, 441 firms engaged in

[16] D. Thoms and T. Donnelly, *The Motor Car Industry in Coventry since the 1890s*, (1985), p. 28.

cycle production had collapsed.[17] Significantly, it was the component sector of the cycle trade that experienced the greater losses, since they were on the whole small units of production, and lacked the resources of firms such as Humber (1898), Progress (1899) and Riley (1898) who had branched out into car production. During the year 1899, the Coventry Wheel Company and the Badminton Cycle and Components Company were voluntarily wound up, the Cycle Components Manufacturing Company returned only 4 per cent in 1897, while Smith's Stamping had not paid investors since 1897. The affect on the small cycle firms was noted by the *Coventry Herald* who commented that 'a number of small firms have disappeared and of several others, more or less prominent at the time of the boom, little is known', the fact that some firms still survived furnished 'substantial cause for wonder'.[18] Moreover, the collapse of the cycle industry had immediate repercussions for the recently formed motor industry. In 1902, Henry Sturmey, who was both chairman of Daimler and editor of Autocar, vividly described how the motor industry had become tainted with the failure of the cycle trade:

> when the slump came in the cycle industry these 'cycle and motor' companies, having but unsecure foundations in cycles, and less than none at all in motors, were the first to collapse, with the immediate result that...'motors' became synonymous with failure...[19]

Clearly, the association between failure and the motor industry that was circulating among the business community at the turn

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[17] CRO, Acc 606, Daffern and Stephenson Collection, Dunlop accounts 1899.

[18] Coventry Warwickshire Collection (hereafter CWC), A. Lowe, 'City of Coventry', (1899-1900), 135-6.

[19] University of London, Simms Papers, List A, 9/67, Sturmey, 'The Motor Car Industry'.

of the century, did little to encourage either new firms being founded in the car component industry or old-established firms to diversify away from their traditional and 'safe' businesses.

However, four years after the formation of the British Motor Syndicate circumstances within Coventry's economy began to change. In 1899, the *Coventry Herald* observed that the motor industry was:

> developing more rapidly than was anticipated three or four years ago. There is, of course, a great deal yet to be done before the perfect vehicle is turned out, but...[the trade is] rapidly passing through its experimental stage and on the way to fairly rapid production.[20]

Thus the two factors which had effectively blocked a component industry from emerging, the experimental stage of car manufacture and the success of the cycle industry were beginning to recede. One indication of its emergence was the establishment of new companies which had the sole intention of manufacturing car components.

In 1898, Hermanus Van Raden founded the Van Raden Company in Queen Victoria Road, Coventry and immediately described the firm as an important 'branch of the automobile industry'.[21] Van Raden successfully specialised in a wide range of glass accumulators and consequently moved to larger premises in Foleshill Road in 1903. By 1908 the company produced both high tension and low tension magnetos, spark plugs, electric horns and car lighting sets.[22] Another company which regarded itself solely as a branch of the motor industry

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[20] CWC, A. Lowe, 'City of Coventry', (1899-1900), 137.
[21] Anon, *Motors and Motoring*, (1908), 79, *Van Raden Trade Catalogue*, (1906).
[22] CRO, Acc 1562/29/13 *Van Raden Trade Catalogue*, (1908).

was the Coventry Motor Fittings Company. Established in 1902 by two former Daimler employees W.S. Tyler and C.E. Hatfield, the company produced a variety of components including radiators, pumps, dash boards, bonnets and wings.[23] Engine making also attracted a number of newly established firms. With French firms such as De Dion and Aster dominating the English market, a number of Coventry firms entered into engine production at the turn of the century. Cromwell Engineering's entry into the engine making sector was a direct consequence of the winding up of Payne and Bates, an early car manufacturing firm. The partnership had depended on Payne's skill as an engineer while Bates financed the business. However, after the premature death of George Bates as a result of a motoring accident, the Bates family withdrew their capital leaving Payne to search for some financial support.[24] Support was found in the shape of Dan Albone who owned a small motor concern in Bedfordshire. However, the capital was fairly small and, consequently, Payne could not afford the outlay required to produce a whole car and had little option but to diversify into producing engines.[25] The motivation behind the formation of Johnston Hurley and Martin seems to have stemmed from a dispute between the three founders and their former partner Forman. In 1903, Johnston, Hurley and Martin withdrew their capital from the business and set up their own firm informing their bank manager that they 'will do well as Forman was no

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[23] Anon, *Motors and Motoring*, (1908), p. 84.
[24] C. O'Gallagher, 'Payne and Bates of Coventry: Pioneer Motor Manufacturers, *Warwickshire History*, 2, 1975, p. 83.
[25] University of London, Pollitt Papers, Book 1, 8/148, Letter to Pollitt from F.S. Payne, 25 February 1946.

good at all'.[26] Their assertion proved accurate for in 1912, whether through lack of capital or poor quality products, the Forman concern was wound up.[27] While both Forman and Johnston, Hurley and Martin, were pioneer engine makers, their fairly low output did little to break French domination.[28] However, Simplex engines, founded by Pelham Lee, and White and Poppe were relatively successful in attracting British car manufacturers away from French engines. In fact, White and Poppe were one of the most successful in attracting custom from the newly established firms. Founded in 1899 by Alfred White, a watchmaker who financed the concern, and Peter Poppe, a Norwegian engineer, the firm pioneered the precision machinery of parts to interchangeable limits.[29] At the 1906 Motor Show fifteen firms were showing cars with White and Poppe engines, while in the same year the firm's carburettor was produced, selling twenty thousand in the following six years.[30] On the whole, newly established firms were formed to exploit a technological deficiency within the motor industry. Clearly this was the case in the engine and electrical sectors of the industry, since eight of the ten engine firms and four of the five electrical firms entered the car component industry as newly founded concerns. Engine making and electrical equipment were still in an early stage of technical development and consequently a number of short-lived firms initially attracted

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[26] Lloyds Bank Archive (hereafter LBA), B379a/12, 15 April 1903.
[27] Public Record Office (hereafter PRO), BT 31 19263/770779, Forman articles of association and winding up certificate.
[28] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, (1962), p. 35.
[29] Thoms and Donnelly, *The Car Motor Industry*, p. 23.
[30] Saul, 'The Motor Industry in Britain', p. 35.

the interest of car assemblers by engaging in product experimentation.[31]

Whilst most new component firms were founded by independent entrepreneurs, in some cases, firms entered the industry through a car assemblers' desire to guarantee supplies. For example, H.J. Baker of Daimler and C.V. Pugh of Rudge Whitworth financed the formation of Sterling Metals which entered the casting sector prior to the First World War.[32] Moreover, a number of Albion Drop Forging's directors, which was formed in 1900, were also prominent figures in the motor car industry. Both the Riley motor firm and Daimler helped Albion's entry and subsequent survival in the supply industry by purchasing substantial shares in the firm.[33]

Although the entry of a number of newly formed specialist firms confirmed that by 1902 Coventry possessed an identifiable component sector, the component industry itself was largely derived from the region's traditional industries. For example, prior the advent of the motor industry, Coventry possessed a large number of coach builders. Consequently, in terms of technical expertise and the plant required, the process of diversification from horse-drawn coaches to motor carriages was neither complex nor costly. Of the ten new entrants between 1902-1912, seven had previously produced horse-drawn coaches.[34] Indeed, by 1906, *The Motor* had noted that the motor

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[31] See chapter 7 for further analysis of the relationship between car component makers and assemblers.
[32] LBA, B379a/19, 27 October 1911.
[33] LBA, B379a/15, 12 November 1905 and B379a/16, 6 February 1907.
[34] For an interesting analysis of the early coach building industry in Britain to 1939, see D. Lyddon, 'Craft Unionism and Industrial Change: A Study of the National Union of Vehicle Builders until 1939', (unpublished PhD, University of Warwick, 1987).

industry had revitalised the fortunes of Coventry's coach building sector:

> Another old-established business, and one which was in a very poor way a few years since, has now completely revived as a result of the advent of the car. We refer to the coach building trade. Three of four firms of repute that were in a declining state ten years back are now working overtime to keep pace with the demand for car bodies.[35]

Coventry's traditional cycle trade also proved to possess a high level of technological continuity with the emerging motor industry.[36] By 1900, the Coventry Chain Company, which had been established by Alick Hill in 1896 for the purpose of making cycle chains, found car production more commercially viable.[37] Likewise, companies such as Automachinery, which was established in 1875 to produce steel balls, A.E. Dover which had manufactured cycle gear cases since 1897 and the cycle accessories firm Bluemels,[38] had all diversified into car component production during the formative years of the twentieth century. In 1906, the Quadrant Cycle Company transferred its technical expertise to the car component industry by establishing the Motor Gear Company with a capital of £45,000.[39] Another influential firm which entered the component sector in 1907 was the fairly large concern, the Coventry Ordnance Works. Established by John Brown, Cammel Laird and Fairfield Shipbuilding in 1905, it was originally formed to produce ordnance. However, in 1907, the business

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[35] *The Motor*, 25 September 1906, p. 207.
[36] See an article detailing the technical similarities between the cycle and motor trades in *The Motor*, 27 February 1906, pp. 94-5.
[37] B. Tripp, *Reynold Chains. A History of the Company and the Rise of the Precision Chain Industry 1878-1955*, (1956), p. 58.
[38] A.E. Harrison, 'The Origins and Growth of the UK Cycle Industry to 1900', *The Journal of Transport History*, 6, 1985, pp. 52-3.
[39] *The Motor*, 30 January 1906, p. 734.

became an important supplier to the car industry through its ability to accept orders for large sets of components.[40]

However, the early success enjoyed by some old-established firms, especially in the radiator, wheels and tyres branches of the trade appear to have deterred potential entrants. Indeed, between 1902-1912 a total of only four new firms entered the both the radiator and tyres and wheels branches of the trade. Significantly, these two component markets had already become dominated by two firms, Coventry Radiator and Dunlop Rim and Wheel. Both firms became established in Coventry during to the boom in the cycle trade and had progressed to take a firm foothold in the car component trade. The Dunlop Pneumatic Tyre Company established a factory in Coventry in 1893 by integrating back into the tyre making process and buying one of its suppliers, the Bryne Bros Company. In 1900 Dunlop entered the car industry and eventually went on to dominate Coventry's car tyre and wheel sector.[41] Indeed, despite a fairly late entry to the motor industry, Dunlop had reached a dominant position in the tyre and wheel sector by 1906.[42] Likewise, it was reported that as early as 1912 Coventry Radiator was responsible for 20 per cent of the industry's output of radiators.[43] Another notable sector which attracted only one new entrant between 1902-1912, was the Stamping and Casting branch of the trade. The lack of opportunity for firms to enter this sector stemmed from the

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[40] W. Lewchuck, *American Technology and the British Vehicle Industry*, Cambridge, 1987, p. 254.
[41] M. French, 'The Growth and Relative decline of North British Rubber Company 1856-1956', *Business History*, 30, 1988, pp.397-401.
[42] G. Jones, 'The Growth and Performance of British Multinational Firms before 1939: The Case of Dunlop', *Economic History Review*, 37, 1984, p. 39.
[43] Thoms and Donnelly, *The Motor Car Industry*, p. 48.

dominance of established firms which had diversified from the cycle industry. Firms such as Coventry Malleable, Smith's Stamping and Coventry Swaging seemed to have, up to 1912, satisfied the motor assemblers' limited demand for castings and stampings.

In some cases an old-established firm's entry to the motor trades appeared to be carefully planned. For example, the diversification policy of Rotherham and Sons, an old-established firm which progressed from making watches to components for cycles and cars, has been described as a 'wholly voluntary action'.[44] Similarly in 1911, W.A. Oubridge, who owned British Chuck and Tool Company, dispensed with the machine tool business and diversified fully into producing piston rings.[45] In the same year, Oubridge changed the firm's name to the British Piston Ring, claiming that it was a 'splendid business' and that his 'piston rings are the best on the market'. In fact, considering the surge of demand from many of the prominent motor car manufacturers in Coventry, it is almost certain that they were the only firm devoted to piston ring manufacture.[46]

Another interesting entry into the car component industry was the Clipper Pneumatic Tyre Company. Formed in 1898 to acquire cycle tyre patents, the company's trading profits increased from £15,871 in 1899 to £31,017 in 1902. At this juncture the company decided to enter the motor industry, and by 1903 production was geared towards manufacturing motor car tyres. However, Clipper's decision to join the motor trade can

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[44] CRO, J. Woodward, 'Rotherham: Watchmakers', (unpublished report, 1975).
[45] *Coventry Standard*, 8 November 1963, Supplement section, ' British Piston Ring. A Story of Achievement 1909-1953'.
[46] LBA, B379a/19, 1 June 1911.

not be attributed entirely to the improving market conditions for specialist producers. In 1903 the firm's Bartlett cycle patents expired reducing the annual income by £87,000, and forcing the company to reconstruct its finances in order to re-evaluate the firm's solid assets. Thus, diversification into the motor trade was seen as a means of recouping the lost revenue. Nevertheless, by 1905, Clipper found that competition in the motor trade was too fierce and was forced to close down its motor tyre section at a cost of thirty five thousand pounds and revert back to cycle tyres. Unlike its major competitors, Clipper faced the major disadvantage of not possessing the facilities to manufacture rubber and consequently were a 'middle man company' heavily reliant on the rubber manufacturing industry.[47]

However by far the most common form of entry was a response to a slump in the firm's indigenous trade. For example, Edward J. Hardy of Coventry, started selling cycle parts in a small way in the 1890s. By 1903, the depression in the cycle industry compelled Hardy to switch from making cycle to car components. Nevertheless, Hardy's experience in the cycle trade ensured that diversification into the motor industry was a relatively smooth process. Hardy's good reputation in the business community was recognised by the manager of the local county branch of Lloyds bank who remarked that he was 'well known to the manufacturers here, having travelled for Lycett [a Cycle manufacturer] for six years'.[48] Moreover, Hardy was able to find a niche in the market by producing one of the first

[47] CRO, Acc 606, Daffern and Stephenson Stockbrokers, Clipper Tyre Company balance sheets 1898-1905.
[48] LBA, B379a/13, 29 June 1903.

reliable transmission units from engine and gear box to the axle, so eliminating belt or chain drives.[49] The process of diversification, was for many firms, a difficult transition, and firms did not immediately reap the benefits of entering an unstable and immature motor industry. For example, after making a net loss of over £4,000 in the cycle crisis of 1899, Brett's Stamping took seven years to record a modest profit of just over £2,000 after entering the motor industry in 1900.[50]

Another typical early entrant to the car component sector was Thomas Smith's Stamping Works. Attracted to Coventry in 1896 by the cycle boom, Smith found that by 1899, the orders for drop forged cycle components had dropped alarmingly. With hundreds of pairs of dies for cycle parts on his hands, Smith sought alternative products for manufacture. Although Smith's Stamping experimented with a variety of products including door handles, boiler fittings and military equipment for the Boer War, it was not until Smith entered the motor industry that he was able to reduce the yearly losses from twelve thousand pounds in 1900 to six thousand pounds in 1901. Smith's early success in the car components trade was largely due to the fact that many of the new customers were former cycle manufacturers and were familiar with the company's working arrangements.[51]

Since many firms entered the car component sector as a direct response to a slump in Coventry's traditional craft industries, there was often a reluctance from firms to commit themselves

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[49] M. Adeney, *The Motor Makers. The Turbulent History of Britain's Car Industry*, (1988), p. 148.
[50] CRO, Acc 606, Daffern and Stephenson, Brett's Stamping Accounts 1899-1906.
[51] A. Muir, *75 Years. A Record of Progress. Smiths Stamping Works Coventry, Clayton Forge Lincoln*, (1958), p. 33.

fully to the motor industry. Moreover, the reluctance for firms to diversify into the motor industry was compounded by the economic and social context of Edwardian Britain. Not only did the early motor trade become retarded by the eccentric design of cars, and suffer an economic slump in 1908, but the industry was also at the heart of the debate over the future of the factory system and of capitalism in Britain.[52] A firm which was perhaps affected by this technological, economic, and political uncertainty surrounding the motor industry was the Coventry Watch Movement Company. Consequently it is worth investigating, in some detail, the Movement Company's process of diversification since the problems confronting the watch firm were common place among prospective car component makers.

The Movement Company was formed in 1889 by several of the city's leading watch makers in an attempt to break the Lancashire Watch Movement's monopoly of watch supplies. However, the Coventry firm suffered from a shortage of capital and was forced to abandon plans for the mass production of watch movements, a decision which left it ill equipped to weather the decline in the watch trade during the late nineteenth century.[53] It became clear to the directors that some form of diversification was essential and it arrived in the form of the Boer War. Although the concern's War Office tender was rejected, they successfully supplied 1,000 rocking bars, centre pieces and springs to White and Poppe, who were engaged in armament production. However, there is little to suggest that

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[52] W. Lewchuck, 'The Return to Capital in the British Motor Vehicle Industry 1896-1939', *Business History*, 27, 1985, p. 21.
[53] J.R. Bailey, 'The Struggle for Survival in the Coventry Ribbon and Watch trades, 1865-1914', *Midland History*, 7, (1982), p. 148.

this diversification away from watch movements was considered by the Movement Company as a long term strategy. Edwin Bolton, the chief engineer, informed the board that the tender for White and Poppe work was offered because it did not require any technical reorganisation, as it was discovered that 'the company's tools would be largely suitable for the production required.'[54]. Significantly, despite the fall in Coventry watch manufacturers from 115 in 1890 to 78 in 1901, the Movement Company still persisted in concentrating on producing movements after the Boer War.[55] Consequently, while a board meeting reported in 1902 that 'sales in watch movements were much less than for many years', the company calculated that stock had increased from five thousand pounds to seven thousand pounds in just one year.[56]

Between 1902-1903, the Movement Company was forced to enter three new manufacturing areas in order to save the company from 'serious losses'. By 1903, the firm produced relatively small runs of cycle, electrical and motor components. The seriousness of the fall in net profits, from over six hundred pounds in 1900 to just seven pounds in 1904 did not allow the directors to formulate a well planned diversification strategy. In order to tender for contract outside of the movement trade, the company employed an agent, Mr Kalker, who had good connections in the cycle and motor trades. However, the contract drawn up between the two parties suggests that the Movement Company considered that cycle, motor and electrical component production would not form the staple business of the

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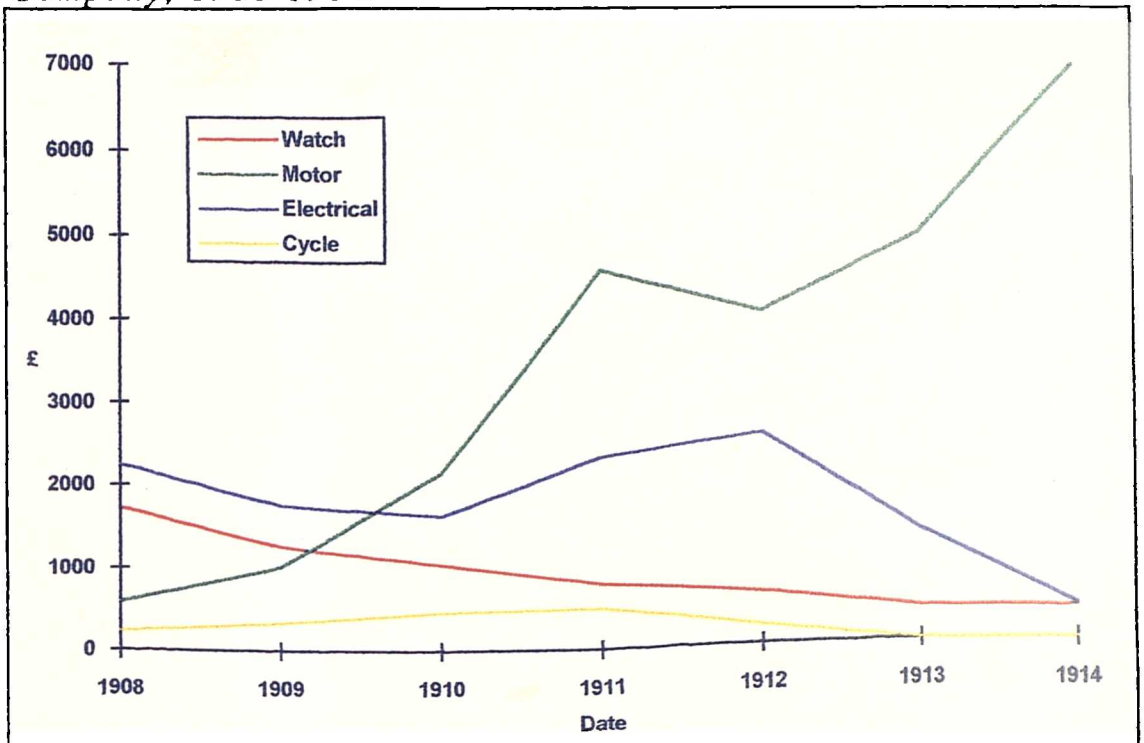
[54] CRO, Acc 542 CWMC. Minute Book 1889-1912, 8 June 1901.
[55] Bailey, 'The Struggle for Survival', p. 136.
[56] CRO, Acc 542, CWMC. MB 1889-1912, 10 February 1902.

company since Kalker was awarded 50 per cent commission. This miscalculation became a serious drain on profits, for while the sale of watch movements continued to slide, orders for cycle gears, spark plugs, motor brushes and rollers, radiator tubes, and electrical motor switches gradually became the source of the company's business.[57] Figure 3.4 demonstrates the growing importance of the motor industry by analysing the income received by the firm's four departments between 1908-1914. Although, business in the cycle department remained fairly low throughout the period, the largest decline in income was experienced by the watch section which fell from an average monthly income of almost £2,000 in 1908 to under £200 in 1914. The largest increase in average monthly incomes was in the motor department which increased its earnings rapidly from just over £2,000 in 1910 to almost £7,000 by 1914.

[57] Ibid, 20 November 1905.

Figure 3.4
Yearly Income of Each Department of the Coventry Movement Company, 1908-1914.



Source: CRO, Acc 1246/8/1-77, Coventry Watch Movement Company, Yearly Income Returns 1908-1914.

By 1908, a nut and bolt department had been established, while Bolton designed and patented a variety of grease cups and motor lubricators which were 'well received in the [motor] trade'. However, despite receiving large orders from Daimler, Rover and Maudslay, the firm still harboured hopes of resurrecting their movement trade. In fact it took the external pressures of the First World War effectively to close the movement shop and terminate any lingering hopes of reviving the movement trade.[58]

Thus far, the chapter has argued that the component industry did not immediately conform to the classic model of an emergent industry, whereby an industry experiences a high number of entries and exits of firms. While a substantial number of firms

[58] Ibid, 11 October 1909 and MB 1913-1932, 26 October 1914. Coventry University, Lanchester Oral History Collection, Interview with Mr Bird, former watch maker, 26 October 1972.

entered the industry, particularly during the period 1908-1912, the number of exits was relatively small. Placed against Hirschman's model, this evidence indicates that assemblers favoured the voice rather than the exit option when dealing with their suppliers. However, alongside this assumption, three important issues should be considered. The slow growth of the component industry was related to the eccentric design of motor cars, a strong cycle industry, and a reluctance to diversify from an old-established trade during a period of economic and social uncertainty. However, the sudden influx of firms prior to the First World War created an intensely competitive market structure, a development which was to have a profound effect on future structures of the component industry. The following section will analyse the impact this had on the entry and exit of firms during the years 1912-1919, the second half of the emergent period for the car component industry.

The Emergence of the Coventry Car Component Trade: The Years of Rapid Expansion and Failure 1912-1919

Table 3.5 shows that between 1912-1919 high levels of entry to the Coventry car component industry were confined to particular sectors of the trade. Moreover, there were striking similarities with the period 1902-1912, as the body, electrical equipment, and engine sectors continued to attract a number of concerns. Significantly, between 1912-1919, the firms' circumstances on entry to the industry differed to the period 1902-1912. Unlike the earlier years, many of the firms entering the industry were

Table 3.5
The Entry, Exit and Origin of Coventry Car Component Firms 1912-1919.

Product	**Entry 1912-1919**	**Origin**	**Exit 1912-1919**	**Origin**
Bodies	5	Old Est: 0 New: 5	7	Old Est: 4 New: 3
Electrical	3	Old Est: 1 New: 2	2	Old Est: 0 New: 2
Casting Stamping	10	Old Est: 6 New: 4	0	Old Est: 0 New: 0
Engines	5	Old Est: 1 New: 4	2	Old Est: 2 New: 0
Radiators	2	Old Est 0 New: 2	1	Old Est 0 New: 1
Tyres and Wheels	0	Old Est: 0 New: 0	0	Old Est: 0 New: 0
Other	0	Old Est: 0 New: 0	0	Old Est: 0 New: 0
Unspec	8	Old Est: 0 New 8	4	Old Est: 1 New 3
Total	**33**	**Old Est: 8 New: 25**	**16**	**Old Est: 7 New: 9**

Sources: Kelly's Directory of Warwickshire 1912-1919, Ryland's Directory of Iron, Steel and Allied Trades 1912-1919, Spennell's Directory of the City of Coventry 1919, Motor Manufactures of Coventry (Museum of British Road Transport), Autocar, The Motor, Lloyds Bank Archive, Midland Bank Archive.

not derived from Coventry's traditional trades but were founded as component firms. A measure of this change is illustrated by the coach making sector, which attracted five new entrants, all of which were founded with the sole purpose of producing motor carriages. Moreover, all five of the new engine firms and two of the three new electrical concerns were established to supply the motor industry. Another contrast with the earlier period, was the rapid increase in the number of firms involved in the casting and stamping branch of the industry. Whilst between 1902-1919, only one new entry was recorded, ten firms began supplying the motor industry between 1912-1919. The fact that many of the firms entering the industry were founded with the

purpose of supplying components, rather than diversifying from an ailing traditional trade, suggests that a number of 'pull' factors existed. Indeed, this period marked a turning point for car manufacturers since they began to make more use of component suppliers. Car assemblers, such as Singer, Standard, Calcott Bros and Humber, began producing new popular light cars designed for the more affluent middle class. These cars, which were produced in larger batches than previous designs, were miniature versions of the larger prototypes but with an engine capacity limited to 1500 c.c.[59] Another 'pull' factor for prospective component firms was the First World War which rapidly increased Coventry's entire engineering sector. However, the war also played a role in the increase in firms departing from the component industry. With the combination of an increased competitive market and a switch from civilian products to war-time demand, the number of exits rose from three, between 1902-1919, to sixteen between 1912-1919. Whilst table 3.5 effectively outlines the changing pattern of exits and entries in particular branches of the component industry, it is necessary to gain an overarching perspective on the circumstances surrounding exit and entry of firms in the industry as a whole between 1912-1919.

The First World War encouraged both an entry and exit of firms from the Coventry car component industry between 1914-1918. Coventry's emerging engineering infrastructure, not only encouraged new firms to settle in the area, but also prompted a rapid building programme by existing firms eager to

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[59] B. Beaven, 'The Growth and Significance of the Coventry Car Component Industry 1895-1914', *Midland History*, 18, (1993), p 113.

accommodate the growth of military production. Such was the intensity of the building activity that an American visitor observed that:

> The people in Coventry walk quicker than other Englishmen. Everyone seems prosperous. There is a briskness in the very air of the place. Your factories are growing as fast as the factories in Detroit - and I cannot say more than that. Everyone is busy...

Indeed, *The Times* agreed and noted that 'new factories were springing up' in Coventry 'at a speed which even Detroit could not exceed'.[60] This rapid building programme clearly impressed contemporary commentators who often highlighted Coventry as a role model for war-time industrial re-organisation. In 1915, *The Times* commented that 'British industries are being turned upside down and mobilised for war', and yet they 'lacked knowledge and experience, for all but a few, most of the work they are called upon to undertake is new'.[61]

The supply problems, which had stemmed from the outbreak of war, encouraged many firms to enter branches of the component trade which had been largely in the hands of foreign competitors. The sector of the component industry which had been particularly affected by foreign competition was the electrical sector. The German electrical firm Bosch's technical and commercial domination in Europe had been so great that the magneto industry in Britain was virtually non-existent.[62] The pressure for firms to enter this branch of the component trade was recognised by contemporaries. A.P. Young, who was a chief

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[60] *The Times*, 17 January 1916, p. 7.
[61] *The Times*, 18 September 1915, p. 11.
[62] Parliament (Commons), *Monopolies Commission on the Supply of Electrical Equipment for Mechanically Propelled Land Vehicles*, 18 December 1963, p. 14.

engineer at British Thompson Houston in Coventry, recalled that:

> the production of a High Tension. magneto in Britain was now a key problem because war with Germany meant most decisively that supplies of Bosch Magnetos from Stuttgart upon which the motor car and aircraft industries (still in their infancy) had depended, would instantly cease.[63]

Until 1914, Bosch had been supplying high quality 4 cylinder magnetos under a free trade system for under £5. However, A.P. Young and the firm's supervisor for purchases W.J. Terry, quickly reached the conclusion that 'this grave national problem presented to the BTH company in Coventry a glorious opportunity'. Support for BTH's entry into magneto production grew until the firm's Rugby based chief executive, H.N.S. Sporborg, gave the go ahead for the whole of the Coventry works to be converted into magneto manufacture in 1914.[64] Since magneto production was still at an experimental stage, BTH appealed to the government for some financial support in a bid to ease their research costs. However, the War Office's response was not at all accommodating as Lord Kitchener simply asserted that 'it should not be difficult to make a little thing like a magneto. All you have to do is place an order for your requirements on a firm like Rolls Royce'. Young found this reply 'quite staggering' and he came to realise that a successful entry into such an immature industry was an immense task:

> Even the great Rolls Royce would have been the first to admit that the desperate problem facing Britain in 1914 could not be disposed of so easily...The simple fact was

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[63] University of Warwick Modern Record Centre (hereafter MRC), MSS 242/BIO/8, A.P. Young Collection, 'An Industry is Born', (unpublished autobiography), p. 2.

[64] Ibid, p. 3, H.A. Price-Hughes, *BTH Reminiscences. Sixty Years of Progress*, 1946, pp. 34-43.

> that *a new industry had to be created* and time was not on our side.[65] [His italics]

BTH's entry to the magneto industry was assisted by the purchase of F.R. Simms' magneto assets after his firm was wound up in 1913. Simms, had lost over £30,000 in his bid to produce a reliable magneto, a loss which helped demonstrate to Young the difficult task he had taken on.[66] Indeed, according to Young, it was only through joint research with a number of new electrical firms, that a magneto industry began to emerge in Britain. Given that technical expertise in this field was limited, the BTH Company contacted ML Magneto and Thomson-Bennett, two recently formed firms which were also attempting to produce magnetos. While, the Birmingham based Thomson-Bennett had experimented with magneto production prior to the First World War by copying Bosch designs, ML Magneto had entered the component industry in a small way in Coventry as early as 1908. However, until the outbreak of war, the firm consistently made losses incurred by insufficient sales due to the experimental nature of their product.[67] Both firms lacked the financial resources of BTH and so were more than willing to co-operate with their large American owned competitor. In 1914, the three firms established the British Ignition Apparatus Association with the intention of providing 'co-operation and mutual help to improve the service given to the magneto industry'.[68] The extent of this early co-operation by firms eager to gain and maintain entry to the electrical branch of the

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[65] MRC, MSS 242/180/8, Young, 'An Industry is Born', pp. 4-5.
[66] Ibid, p. 2, B. Morgan, *The Simms Story from 1891 to 1964*, (1965), p. 12.
[67] LBA, B379a/17, 31 July, 29 October 1908.
[68] MRC, MSS 242, Young, 'An Industry is Born', p. 29.

component industry was recalled by BTH's chief engineer, Young:

> In those early days, frequent meetings of Peter Bennett [T-B], E.A. Watson [ML] and myself were held in the BTH works...The spirit of co-operation thus emerged bore good fruit in the year ahead...There was a free exchange of all information and a technical and design committee met regularly promoting new ideas...[69]

Thus, of significant importance for a firm wishing to gain entry to the magneto industry was geographical location. With the exchange of technical information imperative for such a new and under-developed industry, a midlands based factory was essential. Accordingly, Young later asserted that the 'creation of the high tension magneto industry was centred in Coventry and Birmingham'. Indeed, by the end of the First World War the British Ignition Apparatus Association possessed approximately a dozen members, almost all of whom were based in the west midlands district.[70] Moreover, although the initial manufacture of magnetos at the outbreak war was fairly slow and subject to yearly variation, production had dramatically increased by Armistice. For example, Thomson-Bennett's the monthly output of magnetos increased from 100 in 1914, to over 18,000 in 1918. By the close of the war, the concern's total magneto output stood at over 130,000,[71] while BTH's Coventry factory had produced over 36,000 over the same period.[72]

The First World War also stimulated demand for more developed branches of the component industry, such as engines

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[69] Ibid, p. 28-29.
[70] Ibid, p. 28,29.
[71] *Autocar*, 12 July 1919, p. 53.
[72] CRO, R.G. Holl, 'Lucas Areo Space Ltd. A Review of the Years up to 1990 of the Coventry Site', (unpublished Report, April 1990), p. 7.

and engine components. While engine components were by no means standardized, they did not suffer from the high levels of technical unreliability which had afflicted the electrical branch of the component trade. Although technical difficulties in producing items such as pistons and valves were minimal, there were few firms in the industry devoted to this branch of the industry. The large increase in demand that Pistons Ltd experienced during the first few years of the war, was clearly the motivation behind Frank Bullock's decision to leave the firm which he had helped found and establish Valves Ltd in 1916.[73] Although founded on modest capital, both firms were fairly successful since they exploited previously neglected areas of the component industry. Indeed, throughout the interwar period, Bullock maintained his works were always busy since there was 'little competition'.[74]

Another significant addition to Coventry's engine making sector was the arrival of the French machine gun makers, Hotchkiss and Cie. The company moved to Britain when their parent works in France were threatened with German invasion and set up premises in Gosford Street. The factory, which was regarded as a major centre for munitions work, employed over 2,000 people.[75] The concern's entry into the car component industry occurred just after the war when they received a large contract from Morris to build 100 engines and gear boxes a week.[76] Apparently Hotchkiss experienced few difficulties in re-organising production since, between 1919-1922, the firm had

[73] Midland Bank Archive (hereafter MBA), 358/7, 17 January 1916.
[74] MBA, 358/12, 5 September 1933.
[75] F.W. Carr, 'Engineering Workers and the Rise of Labour 1914-1939', (unpub PhD thesis, University of Warwick, 1978), p. 57.
[76] MBA, 358/6, 29 November 1920.

produced over 20,000 engines.[77] Another new entrant into the engine sector was Nero Engines which was formed by Victor Riley in 1915. This firm took full advantage of the war since as well as obtaining a contract valued at £15,000 from Riley cars, the firm also secured contracts to make shells and fuse heads from Vickers and the government worth over £17,000. However, Nero Engines was plagued by a shortage of capital which prevented an expansion of production, a situation which was to continue until Rover took over the firm after the war.[78]

A more short-lived entry into the engine components sector was encountered by the Holley Brothers firm. This American owned firm had entered the industry by producing carburettors for the War Office. However, since the firm had been founded as a direct consequence of the war and had devoted the whole of its works to Government contracts, it had not built up a working relationship with car assemblers prior to 1914. Subsequently, the firm experienced extreme difficulties in procuring custom after 1918 and, in the following year, it was purchased by T.G. John.[79] John, who was formerly a chief engineer at Deasy, removed the concern from the component industry by diversifying into a car manufacturer by establishing Alvis in 1919.[80] Another firm which left the car component industry due to their wartime activities was the Coventry Ordnance Works.

Although COW was originally established in 1905 to manufacture armaments, it began producing large orders for car

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[77] Anon, *A Souvenir of a Visit to the Hotchkiss Works*, Coventry, (1922), preface.
[78] LBA, B375a/21, 13 January 1915, 21 May 1915.
[79] MBA, 358/6, 23 October 1917.
[80] K. Richardson, *Twentieth Century Coventry*, Coventry, (1972), pp. 46-47.

components in 1907.[81] The most visible indication of the war's affect on the factory was its change in size. The factory nearly doubled in size to over 50,000 sq feet at a cost of £360,000. The cost of the extensions was met by the government under the condition that the firm remained government property after the war. However, the transition from producing car components to shells, fuses and guns was surprisingly difficult considering the company's history of producing armaments. Such was the company's pre-war commitment to producing car components that at the outbreak of war, no orders for armaments had been placed with the firm for over five years and therefore only a small staff were conversant with the manufacture of field guns.[82] However, after a painful two year re-conversion period, at the end of the war, the work's output had included 710 aircraft, 111 tanks, 92 anti-aircraft guns, nearly 4,000,000 cartridge cases and millions of fuses and detonators.[83] Furthermore, the success of the fuse department during the war had a significant affect on the future of the firm in the car component sector. In 1918 Messrs Dick, Kerr and Company purchased COW for £1,400,000, and exploited the achievements of the electrical department by leaving the motor industry and diversifying into producing 'heavy electrical plant'.[84]

A more significant exit from the Coventry car component after the war was the engine makers White and Poppe. Once again, the affect of the war played a leading part in encouraging the firm to diversify from its original product range. In 1914,

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[81] W. Lewchuk, *American Technology*, p. 254.
[82] PRO, MUN 5/373/1200/5, 'History of the Supply of Guns from COW', October 1914-July 1917.
[83] Thoms and Donnelly, *The Motor Car Industry*, pp. 71-72.
[84] *The Times* 15 November 1918, p. 4.

despite being one of the largest engineering works in Coventry, the company was facing intense financial pressure after they were left holding £15,000 worth of engines which had been commissioned by Morris. The firm's financial situation worsened when, in the same year, the supply of Bosch magnetos, which had been obtained on three months credit, ceased and had to be replaced by the American equivalent purchased on cash terms. The war did enable White and Poppe to enter the aero engine business, and in 1915, the firm won a contract with Armstrong Whitworth for 80,000 fuses a week.[85] However, it was White and Poppe's large contracts with Dennis, the commercial vehicle manufacturers of Guildford, which was to prove the most significant customer. After the war, White and Poppe switched entirely to the production of Dennis commercial vehicle engines, and in 1920, the firm was eventually purchased by the Guildford concern.[86] White and Poppe's decision to leave the car component trade may have been influenced by uncertainty in the private car market. Demand and vehicle fashion in the commercial sector was more consistent than the private car sector, and there was less of a possibility of accumulating large sets of unwanted stock that had so threatened White and Poppe's business at the outbreak of war.[87]

The First World War was the catalyst for a number of departures from the car component industry. However, unlike COW and White and Poppe, it was the inability of the component firm to adjust to war-time demand which was at the

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[85] Thoms and Donnelly, *The Motor Car Industry*, p. 72-73.
[86] Surrey County Record Office, 1463/2/3, Dennis Director's Minute Books 1913-1920, pp. 252-254, 258-259.
[87] MBA, 357a/21, 17 October 1914, 4 November 1915.

root of their business failure. For example, in 1910, Priory Accessories was formed by two brothers, T.H. and J.F. Spencer, with a capital of just £100. The onset of the First World War created immense problems for the firm, since it was left with a large and unwanted stock of components for civilian cars. Moreover, the Spencer brothers were unable to raise sufficient capital to re-organise production to meet war-time demand. By 1915, the firm was wound up with debts of between £3,000 to £4,000.[88] The struggle to ascertain war office contracts was a particular problem for small firms in a component sector dominated by one or two leading firms. With the out break of war, unlike the new entrants in the electrical sector which specialised in magneto production, electrical firms such as United Motor Industries and Coventry Headlights Ltd, were unable to hold their position in the car lamp set market as they were in direct competition with Lucas.[89] The war particularly hit the body building sector, since with the almost complete halt in production of civilian cars, the demand for high-class carriage work fell dramatically. The body builders which left the industry, such as Albert Mason, Hewer Bodies and Hobely Bodies were old-established firms which had diversified into the motor industry from manufacturing horse-drawn carriages. These concerns lacked the financial resources required and were less adaptable than the new firms, such as Midland Light Bodies and Midland Motor Bodies which were both financially backed by car assemblers.[90]

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[88] MBA, 358/6, 5 March 1910, 15 January 1915.
[89] PRO, BT31/18752/101921 Coventry Headlights Ltd, BT31/66000 United Motor Industries.
[90] See Exit and Entry Table 1912-1919.

The period 1912-1919, in many respects, cemented the foundations laid during the early years of the car component industry. The highly competitive market which emerged between 1908-1912, was stimulated by the First World War which demanded that firms diversify to military items, embrace rapid production techniques and engage in experimentation. Thus the voice option became less of an attractive strategy for car assemblers due to the highly competitive market. Moreover, the increased use of the exit option exacerbated the instability within the Coventry car component industry, further ensuring that there was a high turn over of component firms throughout the interwar period.

The Interwar Years: The Emergence of Monopolies and the Continuance of Fierce Competition 1919-1939.

Table 3.6 show that the years 1919-1939 were a turning point in the growth and development of the component industry. The industry was subjected to major re-structuring and, for the first time, the number of firms departing from the industry was greater than those entering. This suggests that the emergent period, in which an industry experiences a high level of entries by short-lived embryonic firms, was over by 1939. Indeed, the origins of the firms entering and leaving the industry would support this notion. Many of the firms founded as component firms between 1919-1936, appear to have short life spans since forty-one of the forty-six new entrants and fifty-four of the sixty-three firms leaving the industry were founded as car component firms. Moreover, there was also a relatively low

entry rate to five of the six component categories. On the other hand, coach building, attracted twenty-one new firms, almost half of the total new entrants for the period 1919-1936.

Table 3.6
The Entry, Exit and Origin of Coventry Car Component Firms 1919-1936.

Product	**Entry 1919-1936**	**Origin**	**Exit 1919-1936**	**Origin**
Bodies	21	Old Est:2 New: 19	11	Old Est: 3 New: 8
Electrical	3	Old Est: 0 New: 3	8	Old Est: 2 New: 6
Casting Stamping	5	Old Est: 3 New: 2	4	Old Est: 3 New: 1
Engines	4	Old Est: 0 New: 4	13	Old Est: 1 New: 12
Radiators	0	Old Est 0 New: 0	3	Old Est 0 New: 3
Tyres and Wheels	2	Old Est: 0 New: 2	2	Old Est: 0 New: 2
Other	4	Old Est: 0 New: 4	7	Old Est: 0 New: 7
Unspec	7	Old Est: 0 New 7	15	Old Est: 0 New 15
Total	**46**	**Old Est: 5 New: 41**	**63**	**Old Est: 9 New: 54**

Sources: Kelly's Directory of Warwickshire 1919-1936, Ryland's Directory of Iron, Steel and Allied Trades 1919-1936, Spennell's Directory of the City of Coventry 1919, Motor Manufactures of Coventry (Museum of British Road Transport), Autocar, The Motor, Lloyds Bank Archive, Midland Bank Archive.

However, this sector also experienced a high number of exits, revealing coach building to be a very insecure trade during this period. While every sector shed firms during the interwar period, both electrical and engine firms sustained a fairly high number of exits. By 1939, in contrast to the earlier decades, the structure of the component industry had reached a degree of structural stability. The following section will investigate the circumstances surrounding these structural changes by determining the affect market conditions had upon the various

branches of the trade. The period 1895-1919, left the legacy of an increasingly competitive market which greatly affected the structure of the Coventry component industry between 1919-1939. Although, some large firms had emerged during this period, due to the fairly slow growth of the industry and the interruption of the First World War, no one firm possessed a monopoly interest in its respective sector by 1919. Coupled with the great optimism which overwhelmed the motor industry after the war, a surge of newly established firms entered both the motor car and car component industries.[91]

Although the post war boom in the British motor industry attracted many new firms, a large proportion of firms were short lived due to subsequent recessions and fierce price cutting. Moreover, according to contemporaries, some promoters entered the motor industry in the full knowledge that the firm was simply a pretence to generate money.[92] In 1920, the *Economist* commented that:

> If one wishes to moralise on the credulity of human nature, a fit subject might be that of motor-car manufacturing companies. Since armistice large numbers of engineering plants which owed their existence to the war have come into the market, and promoters have reaped a rich harvest from introducing them to the public as a motor car manufacturing undertaking...in some cases the company has never produced a motor...[93]

There can be little doubt that the unscrupulous promoter and inexperienced engineer were behind the failure of some motor concerns. Indeed, the number of car assemblers in Britain

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[91] For a useful analysis of the highly competitive structure of the motor industry see W. Lewchu k, 'The Motor Industry', in B. Elbaum and W. Lazonick (eds), *The Decline of the British Economy*, Oxford, (1986).
[92] For an analysis of the company promoter's role in creating motor firms for the purposes of generating money see the chapter 3.
[93] *The Economist*, 7 February 1920.

declined from 96 in 1922 to 33 in 1939. The influx of firms into Coventry's car assembly resembled the national trends, with one important difference. Whilst there was a large turnover of car firms in Coventry, forty had entered and left between 1918-1931, of the eleven that remained in Coventry none could compete with Morris and Austin, the two largest car manufacturers in Britain.[94] Likewise, the Coventry car component industry experienced a high turnover of firms with similar results. Of the twenty-nine firms which entered the component industry between 1919-1926, sixteen had left by 1936. Moreover, only Coventry's Dunlop Rim and Wheel was among the select group of component firms such as Pressed Steel, Triplex, and Lucas, which began to dominate the industry during the late 1920s and 1930s.[95]

The short-lived nature of many of the firms which were inhibited by a shortage of resources and engineering experience during the 1920s, was perhaps to be expected. However, the increasingly competitive market environment also hastened the exit of firms with a greater pedigree in component production. An experienced firm which was unable to withstand this increased competition was ML Magneto which left the industry in 1930. Although ML Magneto had been instrumental in creating the British magneto industry, the concern was constantly short of financial resources. Despite a financial re-construction in 1915, the firm's capital was insufficient and consequently Smiths of Cricklewood made a successful bid for the firm in 1919. At this point Smiths, which already had began

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[94] Thoms and Donnelly, *The Motor Car Industry*, pp. 84-85.
[95] *Ibid*, p. 85.

to dominate the motor clocks and gauges market, was eager to compete with Lucas, and believed that the acquisition of ML would provide an ideal entry into the ignition side of the industry.[96] With an increased capital of £10,000, ML Magneto extended its range of products by beginning manufacture combined lighting and ignition sets in 1920.[97] However, unlike the early days when the magneto industry was effectively in the hands of a few firms, the war and the subsequent boom in the motor industry, encouraged a number of new entrants. By 1923, ML's directors reported a 'severe competition in prices', and by the following year, the concern was forced into selling magnetos below cost price.[98] In 1925, the firm decided to cut all overheads 'by stopping all development, research, improvements, etc., in fact anything which involved immediate outlay for deferred results'.[99] This action demonstrates the serious problems facing ML, since this reduction in research came during a period in which more financially secure concerns were experimenting with new forms of ignition.[100] As table 3.7 shows, despite these cut backs, ML were unable to reduce their rising debts. Indeed, if it was not for Smiths' backing it would have been unlikely that Lloyds bank would have granted such a small firm the limits it did.

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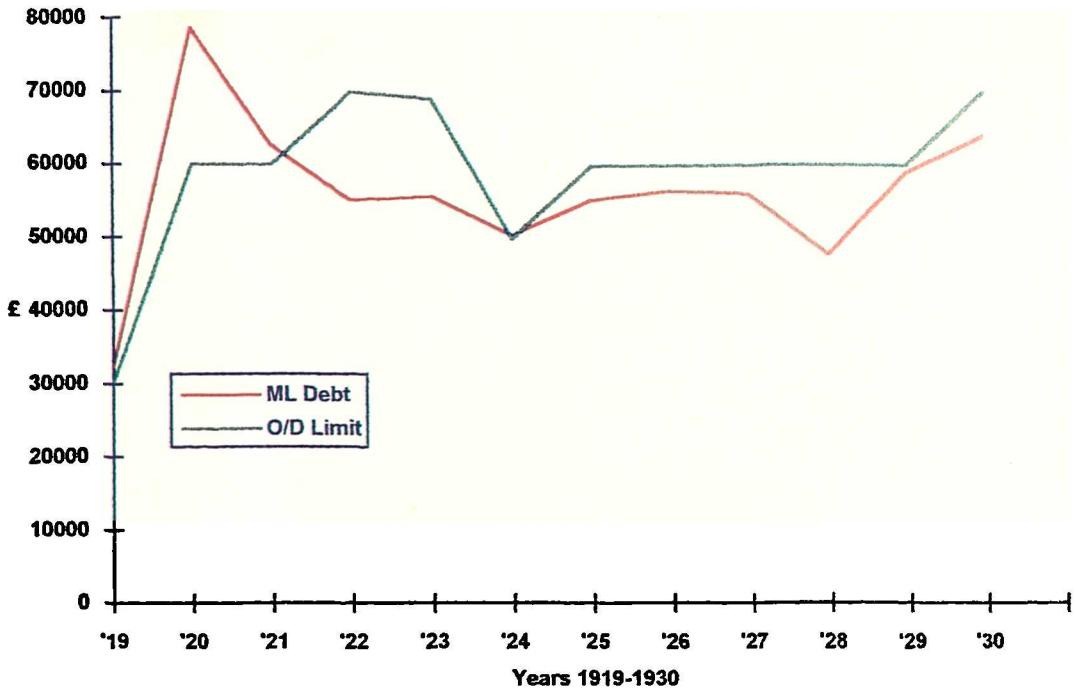
[96] Parliament, (Commons), *Monopolies Report on the Supply of Electrical Equipment*, p. 88.
[97] CRO, Acc 1107/1, ML Magneto Minute Book, 1915-1930, 28 May 1920.
[98] Ibid, 16 August 1923, 16 August 1924.
[99] The reduction of expenditure in research and development was a characteristic of a highly competitive industry see S. Helper, 'Strategy and Irreversibility in Supplier Relations: The Case of the Automobile Industry', *Business History Review*, 65, 4, 1991, p. 809.
[100] Parliament, (Commons), *Monopolies Report on the Supply of Electrical Equipment*, p.16

Chart 3.7

ML Magneto Overdraft Debt and Limit 1919-1930



Source: LBA HO/D/Boa 21-34, Lloyds Bank London Board Minutes 1919-1930.

Moreover, there was a reluctance among ML's customers to use their 'voice' and improve the firm's financial difficulties. During the late 1920s, Austin placed a large contract with ML for magnetos for the Austin Seven. However, Austin's motive for placing the order with ML did not arise out of any loyalty to the magneto firm, rather that ML offered the cheapest prices on the market. Indeed, once it became evident that ML was unable to hold down its prices, Austin switched to a cheaper rival, a move which compounded the Coventry firm's financial difficulties.[101] In 1930, the firm was sold by Smiths to Lucas, after the two firms had agreed a demarcation policy in which Smiths would concentrate on the clocks and gauges, while Lucas continued

[101] Thoms and Donnelly, *The Motor Car Industry*, p. 87.

with producing lighting and ignition equipment.[102] However, Lucas would not tolerate ML's financial instability, and in 1930, the research staff and workers were moved to Birmingham and ML Magneto was wound up.

It was during the 1920s and 1930s that the electrical equipment branch of the component industry began to resemble a structure which was to continue into the post war period. The success of the volume producers, Morris and Austin, proved decisive in affording the opportunity for Lucas and Smiths to establish strong positions in the motor industry. As we have seen, smaller firms, such as ML were unable to compete in terms of research and pricing, and consequently they were unable to gain a foothold in the growing diversity of electrical goods, such as electric horns and windscreen wipers, which car assemblers were now demanding.[103] Indeed, between 1919-1936, eight Coventry firms left the industry, with only one firm entering between 1926-1936. The smaller firms had little option but to concentrate on products, such as magnetos, which Lucas and Smiths were losing interest in. For example, Coventry Magneto and Midland Components were able to continue making magnetos in a small way into the 1930s since it was later stated by Lucas that it had always been the firm's policy to 'confine competitors to the part of the business which we did not desire to hold'.[104] However, the small firms in Coventry which were forced to concentrate on products such as magnetos had a limited life span. While, in 1926 over 80 per cent of cars

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[102] Parliament, (Commons), *Monopolies Report on the Supply of Electrical Equipment*, p.89.
[103] *Ibid*, p. 16.
[104] *Ibid*, p. 54.

exhibited at the Motor Show used magneto ignition, this figure had dropped to 50 per cent in 1929. By 1931, the new coil ignition out numbered magnetos by three to one, and by the outbreak of the Second World War only ten per. cent of cars contained a magneto.[105] Even larger firms, which were not short of financial resources believed that Lucas' and Smiths' emerging Duelopoly and the decline of the magneto signalled the end of their interest in the car component industry. For example, BTH's attempt to enter the car lighting set market when it produced lighting equipment for Armstrong Siddeley, Austin, Clyno and Singer cars during the mid-1920s, failed due to Lucas' competitive pricing. An equally unsuccessful venture followed after BTH, attempting to dislodge Smiths dominant position in the motor trade, displayed a range of car speedometers at the 1933 Motor Show. The final straw for BTH was the decline of the magneto industry. Although the firm had commanded a strong position in the magneto market through out the 1920s, the emergence of coil ignition signalled the end of BTH's interest in the motor industry, and by 1936, it had diversified into producing aircraft components.[106]

Similarly, during the 1920s and 1930s the tyre and wheel sector of the component trade became dominated by a few select firms. Indeed, by the mid-1920s, small, medium and large car firms in Coventry were purchasing wheels and tyres from two main suppliers, Dunlop and Goodyear. Yet unlike the electrical industry, there were no demarcation agreements between the large firms relating to tyres and wheels. Prior to 1926, wheels

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[105] Morgan, *The Simms Story*, p. 17.
[106] MRC, MSS 242/BT/9/11, 'History of the BTH Coventry Works', by L Griffiths, (unpublished report, 4 January 1961), pp. 8-12.

and tyres were not covered by the Mckenna duties, and consequently, Dunlop was often undercut by cheaper American imports.[107] However, even after 1926, competition within this sector remained fierce for a number of foreign competitors side stepped the duty tax by establishing firms in Britain. For example, in 1929, Rover decided to switch suppliers of tyres and wheels from Dunlop to Goodyear which reportedly saved the car assembler £18,000.[108] Thus while table 3.8 shows a rapid growth in motor tyre production during the 1920s, this increase was not due to the establishment of a number of new British firms.

Table 3.8
The Units of Motor Tyres Produced in Britain 1924-1929

Year	Units of Tyres	Year	Units of Tyres
1924	1,972,000	1927	3,480,000
1925	2,900,000	1928	4,805,000
1926	3,000,000	1929	5,720,000

Source: The Economist 19 July 1930.

Indeed, commenting on the evidence presented in table 3.8, the *Economist*, remarked that:

> The increase has been rapid, particularly in the last two years. A note worthy expansion in the output of the largest British concern, the Dunlop Rubber Company is reflected in these figures, but a large share of the recent increase is attributable to the coming into production of large plants established by foreign (particularly American) manufacturers in this country including Firestone and the Indian Rubber Company.[109]

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[107] MRC, MSS 226/ST/1/2/1 Standard Minute Book 1908-1912, 23 November 1909, M. Adeney, *The Motor Makers*, p. 146.
[108] MRC, MSS 226/RO/1/1/5 Rover Minute Book 1926-1936, 3 September 1929.
[109] *The Economist*, 19 July 1930, p. 120.

With such fierce competition, there was little opportunity for small Coventry based firms to enter the industry. While a few firms had unsuccessfully diversified from cycle to motor wheels and tyres at the turn of the century, only one Coventry firm Warland Rim entered between 1919-1939. However, while Warland Rim did well to withstand the slump in tyre production in 1921, in which Dunlop lost over £8 million, the concern was unable to compete with the mass producers which offered car assemblers large set of cheap components and subsequently the firm had been wound up by 1936.[110]

In contrast with the tyre and wheel sector of the Coventry component industry, the body building branch of the trade experienced a fairly high turnover of firms during the interwar period. Moreover, the exit and entry of firms in the body building sector differed from the other branches of the component industry for two critical reasons. In conjunction with having to operate in an intensely competitive environment, body firms also had to contend with changes in both technology and assemblers' demand. Between 1919-1926, twelve body firms entered, attracted to the industry by the immediate post war boom and the fact that no one body supplier had succeeded in dominating the industry. However, four of the twelve firms, Bryant, Hannock and Warman, W.E. Ward and Coventry Motor Wings did not survive beyond past 1926. Nevertheless, a further nine firms began producing bodies in Coventry between 1926-1936. The high number of firms entering the sector supports the notion that body building provided the fewest barriers to

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[110] Adeney, *The Motor Makers*, p. 146.

successful entry to the component industry during the interwar period.

The attraction of firms to body building during the interwar period was the relatively low levels of capital required initially to enter the industry. For example, Motor Panels was founded in 1920 on capital of just £994. This is not to suggest that the firm was free from financial problems. The owners, Turner and King, were heavily reliant on a Midland Bank loan of £1,800, which enabled the firm to purchase larger premises worth £2,500 in 1924. The loan proved critical since the Midland Bank manager reported that prior to the move 'they have been compelled to refuse orders as they have not the space to take on the work'.[111]

The entry and survival of coach firms possessing only small amounts of capital were jeopardised during the late 1920s and 1930s when new productive techniques were introduced into the industry. Until the late 1920s, coach building revolved around 'composite' production methods. Composite production would either consist of pushing metal panels into, or building panels upon, a timber framework.[112] The initial financial outlay for this productive process, which was between £1,000-£2,000 in 1931, placed low barriers of entry to this type body building.[113] However, in 1926 Pressed Steel was established in Oxford with the claim that they were the first firm to manufacture all steel bodies. The firm, which was manufacturing under licence of G. Budd an American body producer, initially suffered a number of

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[111] MBA, 358/7, Coventry Motor Panels balance sheets 1923-1928, 24 November 1924.
[112] T.P. Newcomb and R.T. Spur, *A Technical History of the Motor Car*, Bristol, (1989), p. 400.
[113] *Automobile Engineer*, January 1934, p. 273.

set backs in the quality of its early bodies. During this period, all metal bodies were perceived as a lower quality product and were some times described as 'tinny, noisy contraptions'.[114] Moreover, a further negative aspect of all metal bodies was the high cost of entry into this particular market. In 1934, a prospective body builder wishing to produce all metal bodies required over £40,000 for the necessary jig and presses and would need to produce over 10,000 bodies to recoup the original outlay.[115] This change in technology ensured that there were two forms of entry to body building, with a question mark over which would product would prove most successful. As late as 1934, even the technical journal *Automobile Engineer* could not decide which branch of the body industry had the most secure future.

> The two main systems of construction, namely pressed steel and composite methods, employed in the manufacture of quality produced body work continues to be the subject of much discussion. It is difficult to estimate which of the two systems is more popular or decide whether one will eventually replace the other.[116]

With this uncertainty hanging over the construction of carriages, it is perhaps no surprise that there was instability in Coventry's body building sector. Between 1926-1936, only one firm, Fisher and Ludlow entered into pressed body production. Fisher and Ludlow was a large Birmingham based firm which diversified from making household metal appliances into body building in 1929. Between 1929-1932, the concern rapidly increased production and, in 1936, a purchased purposed built factory next

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114 Newcomb and Spur, *A Technical History of the Motor Car*, p. 403
115 *Automobile Engineer*, January 1934, p. 273.
116 *Ibid.*

to its chief customer, Standard Motor Company in Tile Hill Coventry.[117] Indeed, it was only through an agreement with Standard for the car company to order large sets of bodies which allowed Fisher and Ludlow to scale the high entry barriers and open a factory in Coventry. In relation to the initial outlay for the new Coventry factory, the Fisher and Ludlow board of directors announced that 'to install the great range of presses, interchangeable dies and the other equipment is so costly an undertaking that can only be justified by a very large turnover'.[118] Without vast amounts of capital and long term volume production agreements with car assemblers, the remaining body builders in Coventry entered the composite side of the trade, an old but far from extinct form of production.

Many car assemblers continued to require composite bodies, a demand which lasted until the late 1940s. The popularity of composite bodies among the car assemblers stemmed from the fact that production did not entail the purchase of large and expensive presses. Therefore, it was practical for body makers to alter designs without great expenditure or loss of time. Indeed, the preparation time for new designs using pressed steel production techniques was between six to twelve months, while composite body firms could start construction after only eight weeks.[119] These were important considerations for both the small body firm and the car assembler. Whilst the small supplier could not afford long periods of preparation without income, the car assembler was operating within a market which

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[117] MRC, MSS 226/ST/1/3/1/ Standard Board Minutes 1923-1970, 10 November 1937.
[118] CRO, Acc 606, Daffern and Stephenson Collection, Fisher and Ludlow balance sheet 1932.
[119] *Automobile Engineer*, January 1934, p. 273.

demanded constant changes in the appearance of cars.[120] Such was the vast variety of body styles available that Austin, for example, listed 52 different bodies in its 1934 catalogue.[121] Indeed, in the same year Herbert Austin announced to distributors that 'no sooner are we in full swing with current models than we have to turn our thoughts and energies to redesigning the body or chassis in an endeavour to meet - or anticipate - the public's ever changing moods'.[122]

Consequently it was within Coventry's composite body sector which most change occurred. Firms which adopted this form of production around the needs of volume production were the most successful entrants during the 1920s and 1930s. By the extensive use of jigs, composite bodies could be built relatively cheaply and in some volume, with the minimum amount of skilled labour. For example, Cross and Ellis, a firm established just after the First World War, adapted new production techniques to traditional composite construction. In 1927, it was noted that 'a very well equipped saw mill is a contributory cause for such a large output from so few men. In fact, very little hand work is done to the production type of body, other than assembling.'[123] In contrast to Cross and Ellis, the old-established firms, such as Thomas Pass and Baker continued to use a large number of skilled workers, which pushed up costs and kept production totals to a minimum.[124] The problems which

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120 See Chapter 7.
121 Newcomb and Spur, *A Technical History of the Motor Car*, p. 403
122 R, Church, *Herbert Austin. The British Motor Car Industry to 1941*, (1979), p. 116.
123 *The City of Coventry Official Handbook 1927*, (Cheltenham, 1927), p.19.
124 CRO, City of Coventry Enrolment of Indentures 1895-1930. At two year intervals between 1895-1930, a list was compiled of apprentices enrolled at car component firms. The branch of the component industry

held for the future, were recognised by J.H. Butlin, whose dissatisfaction with Thomas Pass' methods appeared to be the motivation behind his entry into the trade. In 1933, Butlin's entry into the industry was recorded by the Midland Bank manager. The manager, while noting the small scale of the firm commented that:

> JHB, who was until six months ago manager of Charlesworth Bodies, has started on his own. He has a good reputation, and is so busy he had to refuse orders. He has offered £1,500 for a factory in Leicester Causeway.[125]

Unlike many of Butlin's contemporaries who entered the industry at this time, the firm survived the Second World War and continued to trade until the mid 1950s.

However, while the continued use of outdated techniques account for many of the eleven exits that occurred between 1919-1936, some body firms left the industry through a lack of capital or mis-management. For example, Swift Bodies, which had experienced severe financial problems during the late 1920s required the good will of their creditors in 1929 to stay in business. However, this proved only to be a stay of execution as the concern, which was owned by the Du Cros family, was finally wound up in 1931.[126] The failure of Holbrook Bodies, which was established in 1920, stemmed from the lack of positive leadership and a constructive approach to forward planning. The continued use of highly skilled labour and traditional productive methods ensured that the concern faced

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which was most represented was the coach sector. Within in this sector, the traditional coach firms which had diversified from horse-carriage work, such as Charlesworth and Thomas Pass, possessed the most entries.

[125] MBA, 358/13 7 December 1933. For the period when it appears that T. Pass is wound up the business see MBA, 358/11, 29 May 1928.

[126] CRO, Acc 1246/23/1-7, Coventry Movement Company, Acc 985/1/1, Alvis Minute Book, 20 January 1932.

severe financial problems by the late 1920s. A belated attempt to rationalize production was made when the firm moved into a modern factory in 1929. However, these plans disrupted the concern at a critical time since the Board announced that the firm had lost over £12,000. The chairman blamed this loss on the 'cost of removal and the consequent loss of output from the latter coupled with the difficulties of re-organisation'. Consequently the Chairman, W.A. Oubridge, resigned from the firm on the grounds of 'ill health', though he continued to chair the successful British Piston Ring until his death in 1942. In the following year, after a substantial loss of nearly £4,000, F.H. Stonebanks resigned from his position as Holbrook Bodies General Manager, and by 1931, the concern was wound up.[127]

The uncertainty surrounding coach making was in stark contrast to Coventry's engine making sector which experienced a decline in the number of independently owned firms during the interwar period. Between 1926-1936 the only new entrant was formed by Johnston, Hurley and Martin who simply reconstructed their old firm and renamed it Alpha Engines. By 1936, there were only two other firms, Riley and Courthouse Green Engines which were regularly making whole engines, and they both were owned by car assemblers. Indeed, by the out-break of the Second World War, Coventry possessed only two engine making concerns when Riley Engines was wound up after the family firm was acquired by Morris in 1938.[128] This underlined the growing trend at the close of the interwar period,

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[127] CRO, Acc 606, Daffern and Stephenson, Holbrook Bodies balance sheets 1929-1930.
[128] PRO, BT31, 275907/33428 Riley Engine Company, articles of association and winding up certificate.

of assemblers producing in-house engines and explains the decline in Coventry engine firms.[129] Consequently, as the figures in table 3.6 suggest, the market for prospective entrants was extremely limited. Moreover, the re-structuring of the motor industry during the 1920s, which shook many of the small car assemblers out from the trade, also had adverse affects on the engine making sector. Such was the importance of the engine to the assembler, the car firm often demanded that their supplier provide a unique and specially designed engine. However, in the event of the car assembler failing, the engine supplier was left with large sets of unwanted and non-standardized engines. These circumstances surrounded the departure of Coventry Climax from the private car engine sector. Formed in 1917, by H. Pelham Lee, Climax had never been committed fully to the production of private car engines.[130] In addition to private, commercial and racing engines, the concern also manufactured generators, and fire pumps.[131] Nevertheless, in 1931, Climax faced severe financial problems when, without warning, the Swift car firm was wound up. It was reported that 'when the factory closed down Coventry Climax found themselves saddled with quite a lot of completed Cadet Engines for which there was no market available, as well as all the jigs and tools for manufacture.' However, serious losses were avoided when Climax temporarily diversified from the motor

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[129] By the close of the interwar period, car assemblers began to exert more control over key components such as engines, transmissions and axles by making these components themselves. For further analysis of the changing relationship between car assemblers and car component makers see chapter 6; A similar situation had developed in America see S. Helper 'Strategy and Irreversibility in Supplier Relations' p. 805.

[130] *Coventry Standard* 30 January 1953, p. 4.

[131] J. Lane, *A Register of Business Records of Coventry and Related Areas*, Coventry Polytechnic, Coventry, 1977. p. 20

industry by converting Cadet engines into fire-pumps since 'very little modifications were required'.[132] The instability of the motor industry during this period was perhaps one of the key reasons that persuaded Climax to continue to produce fire-pumps, forklift trucks and specialised racing engines after the Second World War.

Conclusion

Hirschman's 'Exit, Voice and Loyalty' model, has been useful in analysing the pattern of entries and exits of firms in relation to the nature of competition within the car component industry. The evidence drawn from the Coventry car component industry differs significantly from Foreman-Peck's research on the car manufacturers. Whilst Foreman-Peck suggested that car assemblers were sustained through the adoption of the voice facility, the evidence for the car component industry showed that there was a minimal use of the voice option due to the highly competitive nature of the component industry.

This chapter has argued that the nature of competition in the component industry was largely determined by Coventry's changing economic structure during the late nineteenth century, and the buying policies adopted by car manufacturers between 1908-1939. Moreover, the study has shown that it is imperative to analyse the early years of the car component in order to understand how the competitive nature of the market emerged. Since the majority of the firms that initially entered the

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[132] CRO, Acc 1296/5 Swift Motor Company, 'Vintage Swift', by J. Price, (n.d.).

component industry were derived from the cycle, watch and coach industries, it took a slump in Coventry's traditional industries, for firms to commit themselves fully to the motor industry. Consequently, many of these traditional firms entered the component industry in a financially weak position, a factor which was exploited to the full by the car assemblers. However in most sectors of the component industry entry barriers were fairly low. Firms which diversified from cycle, watch and coach making to car component manufacture, discovered that there was a high degree of technological transfer in terms of the productive process, factory size, and the machine tools required. However, after this rather slow start, the large influx of concerns between 1908-1912, ensured that fierce competition prevailed in almost all sectors of the industry. This period left a legacy which was to inflict the car component industry from the First World War and through the interwar period. The competitive market structure, which had emerged prior to the First World War, became ingrained in the foundations of the motor industry during the interwar years, a phenomenon which helps explain the high number of entries and exits of firms during this period. This environment was not conducive for one or two firms dominating a sector of the industry as the myriad of small firms were constantly undercutting one another. Significantly, apart from Dunlop, all of the large and dominant car component firms grew outside of Coventry, and much like the car assemblers, the city lost its position as a leading location for car component manufacture.

Chapter 4.

Sources of Finance: Coventry Car Component Firms 1895-1939.

This chapter explores the sources of finance open to the car component firms in Coventry between 1895-1939. Whilst historians, such as Saul, have argued that the larger motor car manufacturers received adequate funding from Britain's financial institutions, little attention has been focused on the smaller motor firms or the car component industry.[1] The first section will investigate whether the British capital markets satisfactorily met the demands made by the car component industry or whether firms which required financial support were forced into alternative forms of capital provision.[2] Consequently, alongside an analysis of the capital markets, the study will investigate the alternative forms of raising capital, such as the formation of private joint stock companies, the supply of funds by families and friends and the important role played by the clearing banks.

The Use of the Capital Markets.

Prior to the 1880s, the Stock Exchange dealt in the shares of relatively few domestic industrial companies and was mainly

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[1] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, 1962, p. 32.

[2] See A.E. Harrison, 'Joint Stock Company Flotation in the Cycle, Motor-Vehicle and Related Industries 1882-1914', *Business History*, 23, (1981)., M.H. Best and J. Humphries, 'The City and Industrial Decline', in B. Elbaum and W. Lazonick (eds), *The Decline of the British Economy*, (Oxford, 1986),223-239., D.M. Ross, 'The Clearing Banks and Industry - New Perspectives on the Inter-war Years', in J.J. Van Helton and Y. Cassiss (eds), *Capital in a Mature Economy. Financial Institutions, Capital and British Industry 1870-1939*, (Aldershot, 1990), pp 53-70, M. Collins, *Banks and Industrial Finance in Britain 1800-1939*, (1991).

concerned with home government stock, home railways and overseas investment. However, after the 1880s a number of firms became limited liability companies and went public. One motivation for the public floatation of shares was to put an objective value on the shareholdings of family members and to create an active market in the shares to make the assets more realizable.[3] However, the main purpose for many businesses to go public was to raise additional capital, and this was particularly the case for the 'new industries'. By 1914, a number of the larger motor car firms had become public limited companies. Whilst Daimler and Deasy had been established as public companies in 1896 and 1906 respectively, several car firms, such as Standard and Rover, went public in order to expand their manufacturing activities. In 1913, Standard issued public shares to support investment into greater output, while Rover secured the necessary funds from the market to purchase the coach builders Hawkins and Peake in 1907.[4]

However, although the capital markets were utilised successfully by some of the large car manufacturers, there were few Coventry car component firms which chose this option of acquiring financial support. An analysis of the *Economist* and the *Investors' Monthly Manual* revealed only four Coventry car component firms which utilised the London Stock Exchange between 1895-1939. Significantly, two of these firms, Dunlop and British Thompson and Houston (BTH), were large

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[3] J. Armstrong, The Rise and Fall of the Company Promoter and the Financing of British Industry', in J.J. Van Helton and Y. Cassiss (eds), *Capital in a Mature Economy. Financial Institutions, Capital and British Industry 1870-1939*, (Aldershot, 1990), pp. 118-119.

[4] D. Thoms and T. Donnelly, *The Motor Car Industry in Coventry Since the 1890s*, (1985), p. 54.

multinational companies. Dunlop, which in 1890 acquired important and profitable patents, was floated successfully on the stock exchange in 1896 and, in the same year, the foundation of BTH was facilitated through the raising £1 million capital through public share issues.[5] Although the search can not be regarded as conclusive, it does suggest that Coventry Chain, in 1907, and Cornercroft, in 1936, were the only Coventry based component firms which were quoted on the London Stock Exchange during this period. Why then was this form of funding within the Coventry car component industry such a rare occurrence?

A significant feature of the Coventry car component industry was that, throughout the period 1895-1939, firms were founded and functioned on small sums of capital. A data base was created of the known capital of 44 Coventry based component firms that traded in the industry between the period under study (see appendix 1).[6] In the case of multinationals such as Dunlop and BTH, the capital of the Coventry subsidiary was noted rather than the capital of the whole organisation. A firm's capital on foundation or the earliest reference to a firm's capital was recorded and the mean figure for the 44 component firms was determined. The result clearly illustrated the small scale of the industry since the mean capital for the sample of component firms was calculated at only £14,506. Moreover, the foundation

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[5] G. Jones, 'The Growth and Performance of British Firms Before 1939: The Case of Dunlop', *Economic History Review*, 37, (1984), p. 36-7, R. Jones and O. Marriott, *Anatomy of a Merger. A History of GEC, AEI and English Electric*, (1970), p. 65.

[6] The search for a firm's capital involved the analysis of various firm archives, the Lloyds Bank and Midland Bank archives, the Public Record Office Board of Trade files, Daffern & Stephenson Stockbrokers balance sheets (Coventry Record Office 606), and *The Coventry Stock and Share List*, 1900-1939 (Colindale Newspaper Library).

of firms on small sums of capital was not confined to the formative years of the motor industry but was common throughout the interwar period. As late as the 1930s Coventry component firms, such as United Accessories, Self Changing Gears and Modern Headlights, were being founded on capital of between £1,000 to £10,000.[7] However, the fact that the vast majority of the firms sampled were founded on modest sums of capital does not, in itself, explain why component firms shied away from utilising the capital markets. Indeed, why did so few firms not imitate Coventry Chain and Cornercroft by converting the firm into a public company, thereby vastly increasing its capital and improving its manufacturing capabilities? An analysis of these two company floatations will demonstrate why the firms held a somewhat unique position within the Coventry car component industry and why, particularly with the difficulties experienced by Coventry Chain, many firms avoided securing funds form the capital market.

A factor which linked both Coventry Chain and Cornercroft, and which gave rise to their unique position in the industry, was that by the time of public issue they had secured a relatively strong position in the component industry. As chapter three has demonstrated, all five branches of the component trade, viz. drop forgings, tyres and wheels, engines, bodies, and the electrical sector, remained highly competitive throughout the period under study. However, both Cornercroft and Chain developed new products outside these competitive branches of the trade and subsequently captured a large share in their

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[7] *Coventry Stock and Share List*, 1 July 1932, p. 1, 2 June 1933, p. 1, 3 August 1937, p. 1, CRO, ACC 985/87/1, Armstrong-Siddeley Collection, Articles of Association for Self Changing Gears, 1934.

respective markets. In the case of Cornercroft, their strong position in the industry ensured that external financial support was imperative by the mid-1930s.

Established by two engineers, John Alan Corner and Norman Rycroft, Cornercroft was one of the many firms which entered the component trade in the early 1920s following the wave of optimism which swept across the motor industry immediately after the First World War. Although Rycroft and Corner possessed just over half of the firm's capital between them, the remainder was financed by a local businessman, Thomas Wheeler Meates who possessed shares to the value of £1,000. In common with many newly established firms of the period, the concern worked with capital of less than £3,000 and consequently could only afford to rent a small workshop in Vecqueray Street. However, Cornercroft survived the ensuing 1921-1922 motor depression by pioneering and patenting the manufacture of wheel discs.[8] Despite supplying major car manufacturers, such as Rolls Royce, Humber and Standard, the firm had still not embraced mass production methods by the early 1930s. Indeed, a journalist who inspected Cornercroft's factory for *Autocar* in 1934 commented that:

> I imagined that all these Ace discs would be pressed out of sheet metal by great hydraulic presses in large numbers by mass produced methods. This however, is not so, although the Ace factory can produce considerably over 1,000 different types of discs to suit most kinds of car. Each disc is hand-made, and made separately.[9]

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[8] Coventry Record Office (hereafter CRO), Acc 1468/1/1, Cornercroft Minute Book 1927-1936, 12 September 1929.
[9] *Autocar*, 21 September 1934, p. 528.

During this period, Cornercroft consistently refused requests from car manufacturers to produce long runs of wheel discs. Instead, sets were kept to a minimum of 45 per company to avoid bad debts and to ensure that the firm's limited working capital was not tied to large accumulations of unwanted stock.[10] However, in order to maintain contracts with the larger car makers such as Austin, Morris and Humber, it became apparent that Cornercroft would need to embrace the principles of mass production. Since neither Rycroft, Corner or Meates possessed the capital required, the firm was converted into a public company and the capital was increased from £2,700 to £150,000 by the creation of 499,500 additional shares at 4s and 120,000 preference shares at 10s each. The concern was now able to extend its new premises at Queen Victoria Road and invest in automatic machinery. The benefits of this new investment were reflected in the monthly net profits which leapt from £2,420 in March 1932 (March was the peak period for the motor industry) to £22,066 in March 1937.[11] However, this initial success was at the expense of the firm's two pioneers, Rycroft and Corner, since due to a shift in the balance of shareholding, control of the firm was transferred to two new directors based in London, Captain W.F. Strickland a Coventry MP, and H. Wylie.[12]

Alick Hill's motivation behind founding Coventry Chain in 1896 with a capital of £300, was to exploit a previously neglected area of the cycle component market. Norman Hill, the former Coventry Chain director, recalled that 'my brother Mr

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[10] CRO, Acc 1468/1/1, Cornercroft Minute Book 1927-1936, 30 August 1928. *Autocar* 21 September 1934, p. 527.
[11] CRO, Acc 1468/1/1 Cornercroft Monthly balance sheets March 1932, March 1937.
[12] CRO, Acc 1468/1/1 Cornercroft Minute Book 1927-1936, 22 June 1936.

Alick Hill, then in America, wrote to say that he was returning, determined to manufacture the only part of a cycle which was not made in the home of the industry, viz. the chain'.[13] Although Chain increased its capital to £8,008 and become a registered company with a limited liability status in March 1902, the firm was consistently unable to attain the financial resources required.[14] Thus, Norman Hill noted that, until the intervention of Daimler in 1907, Chain had to resort to securing short term loans from the bank and was forced into using inadequate machinery and premises.

> We purchased power in the shape of steam from a carpet beating factory at the end of the entry and I well remember the rushing to and fro when the already ancient steam engine was being over loaded. Having devoured several other shops and two private houses, we were still in the clutches of the old steam engine and the bank when Mr Percy Martin offered to supply us with £30,000 from some members of the Daimler Company.[15]

In order to facilitate this investment programme, Daimler persuaded Chain to became a public company in 1907.[16] The firm's capital was increased to £100,000 which financed the building of a modern factory on a new seven acre site in Spon End costing over £6,000.[17] The bulk of Daimler's investment was derived from two men who were both elected on to Chain's board of directors. Percy Martin, the Managing Director of

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[13] Manchester Central Library (hereafter MCL), M105/061.5/CC 932/1, Extract from Statement in Guard Book, Norman Hill, 1932, B. Tripp, *Renold Chains. A History of the Company and the Rise of the Precision Chain Industry 1879-1955*, (1956), pp 72-73.

[14] Public Record Office (hereafter PRO), BT31/9785/72901, Coventry Chain List of Share Holders 25 March 1902.

[15] MCL, M105/061.5/CC 932/1, Extract from Statement in Guard Book, Norman Hill.

[16] For an analysis of Daimler's involvement in Coventry Chain see chapter 7.

[17] Midland Bank Archive (hereafter MBA), 368/5, 18 April 1907.

Daimler held £2,600 shares while Albert Wood, described as a 'Gentleman from Windermere' became the largest single investor in the company with £10,000 worth of shares.[18] In 1913, Coventry Chain once more utilised the capital markets, when the capital of the firm was increased to £250,000 in order to cope with the 'large quantities of vehicle chains' required by firms such as Daimler, Siddeley-Deasy and Rover.[19] There is little doubt that Coventry Chain held a unique position in the car component industry which made it attractive to external investors. First, the firm had secured a dominant position in the much neglected vehicle chain industry and also, Chain's close and profitable relationship with Daimler instilled confidence in prospective investors. Although Chain and Cornercroft's particular circumstances may explain why few Coventry car component firms used the capital markets, the fact that a degree of control shifted away from the original founders was also a potent factor deterring firms from ascertaining external finance.[20] Indeed, after Coventry Chain's floatation, a dichotomy emerged on the firm's board of directors between the Coventry interests represented by the Hill family and the London based directors and shareholders represented by Charles Goff.[21]

Two further factors, which also explain the reluctance of component firms to be publicly quoted on the stock exchange,

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[18] MCL, M501/650.0124/CC 902/1f, Coventry Chain Minute Book 1902-1931, 19 April 1907.
[19] CRO, Acc 594/143, Coventry Chain Company shares issue 22 June 1915.
[20] Thoms and Donnelly, *The Motor Car Industry*, p. 56. The debate surrounding the 'conservative' instincts of a founder of a firm and the issues relating to the control of business after becoming public companies is examined in chapter 5.
[21] Tripp, *Renold Chains*, p. 123. Also see chapter 5 which analyses in detail the struggle for control over Coventry Chain between 1907-1930.

relate to the public's perception of the 'new industries' and capital markets during the late Victorian and Edwardian era. First, the capital markets, on the whole, did not regard firms involved in the 'new industries' in a very favourable light. Most of the firms involved in the cycle, motor and component trades were small firms and considered high-risk ventures. The generally unreceptive response from the market to cycle firms issuing public shares served as a warning to the Coventry car component industry.[22] Indeed, many of the Coventry car component firms resembled cycle firms in terms of size and structure since many of the firms had been derived from the cycle industry.[23] Harrison's study of the cycle industry revealed that the great majority of companies appealing to the market failed to obtain full subscription. The research concluded that 'the capital markets, apparently, tended to discriminate against the small concern, though issues of much larger sizes were not necessarily certain of a favourable reception'.[24] For example, well established cycle and component firms such as Rudge Cycle (1887) Clipper Pneumatic Tyre (1887), Thomas Bayliss, Riley (1896) and Thomas Smith (1897), all failed to obtain full subscription.[25] The extent of under-subscription among small cycle and accessory firms is even more significant when it is considered that the middle years of the 1890s was the boom period for the British cycle industry.

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[22] Under-subscription was a problem throughout the Edwardian period see *The Motor*, 17 April 1906, p. 300, 7 May 1907, p. 402.
[23] B. Beaven, 'The Growth and Significance of the Coventry Car Component Industry, 1895-1914', *Midland History*, 18, 1993, p. 108.
[24] Harrison, 'Joint Stock Company Flotation', pp. 178-179.
[25] *Ibid*, p. 188,190.

The second factor which deterred firms from issuing public shares was the dubious image the capital markets had acquired during the late nineteenth and early twentieth century. Since there had been few company floatations prior to 1880, the existing legal framework offered few guidelines or rules to follow. Consequently, the increase in public floatations gave rise to the company promoter who exploited the business community's naivety to make substantial profits at the expense of the firm's vendors. The firm's decision to employ a company promoter prior to floatation was to ensure that the firm received maximum publicity to tempt prospective investors. Company promoters would engage in 'creative' writing to turn out an appealing prospectus and, furthermore, it was not unknown for sweeteners to be paid to financial journalists to hype-up a firm's floatation.[26] In 1906 *The Motor*, commenting upon the under-subscription of publicly floated motor firms, noted that:

> the professional company promoter, with his profit-taking capabilities, is to be avoided as a delusion and a snare. His aim is to buy at £100,000 and sell at £150,000, and the new company is worst off in that, with but a small increase in capital, profits must be 50 per cent greater in order to maintain the same rate of dividend.[27]

Indeed, the role of the promoter was neither technical nor financial since his function was to buy the firm outright from the vendors, with the cash for the firm going to the previous shareholders. After the firm was publicly floated, any profits made on the sale of the business to the market was pocketed by

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[26] Armstrong, 'The Rise and Fall of the Company Promoter', p. 117
[27] *The Motor*, 17 April 1906, p. 300.

the company promoter. In effect, the company promoter did not provide finance for the industry, but acted as the middle-man.[28]

The lengths that the unscrupulous company promoters would go to float a business, (in terms of fictional prospectuses, bribes and sweeteners), ensured that by the early twentieth century when the car component industry was beginning to grow,[29] many investors shied away from the motor industry. During the 1890s, it was the motor industry which became the target for company promoters, which goes some way in explaining its faltering start. Indeed, Armstrong asserts that 'bicycles and motor-cars were puffed and pushed in the 1890s so extravagantly that investors were wary of any company of this type for some time'.[30] The dubious dealings and effective advertising campaigns by Henry Lawson, attracted one million pounds to motor car firms which had never, and were destined never, to produce marketable vehicles.[31] The excitement surrounding the 'new high-tech industries' in 1896 encouraged a rush of small, and often short lived, motor car firms to issue public shares. Certainly, contemporaries viewed the activities of Lawson with great suspicion and laid the blame for the slow start of the motor industry at the door of the company promoter. During the first few years of the twentieth century, Henry Sturmey, the editor of *Autocar*, explained his reasons for the motor industry's slow start. He claimed that the unscrupulous company promoter had invited the floatation of weak companies with no experience in

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[28] *Ibid*, p. 128.
[29] Beaven, 'The Growth and Significance of the Coventry Car Component Industry', p. 106.
[30] Armstrong, 'The Rise and Fall of the Company Promoter', p. 130.
[31] S. Morewood, *Pioneers and Inheritors: Top Management in the Coventry Motor Industry 1896-1972*, (Coventry, 1990), p. 92. See also Chapter 2.

the motor industry 'with the inevitable result that..."motors" became synonymous with failure'. He added that the problems stemmed from firms appointing commercial men or company promoters, on to the board of directors since they possessed:

> the least knowledge of the requirements of system of an engineering factory...the concerns blundered on, without a head and without a defined policy, with only the natural result - the capital was again strengthened in its distrust of the industry by their failure to secure financial success.[32]

The investors' suspicion of the floatation of motor car firms was reciprocated by the motor industry itself. As late as the 1930s, William Morris viewed the capital markets with great suspicion. In 1936, Morris considered floating his remaining private company, Morris Commercial and contacted Barclays Bank for further advice. In a letter to the Bank, Morris outlined his scepticism of the company promoters, which almost certainly was derived from his experiences of the early motor industry. He explained that he wanted to:

> avoid all contact with financiers and finance houses, whose usual practice seems to be to take a handsome picking from anything which falls into their hands, before passing it on to the public in a watered condition. For instance, I have heard a report that the city made a considerable profit out of the Pressed Steel floatation.[33]

This mistrust between the two parties does go some way in explaining the low number of Coventry car component firms turning to the market for external finance. Together with the failure of the cycle and early motor car industries to achieve full subscriptions and the small size of firms engaged in the

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[32] University of London, Senate House Library, Simms Paper List A, 9/67, H. Sturmey, 'The Motor Car Industry. Why British Manufacturers have failed to make headway', c1902.

[33] Barclays Bank Archive, Acc 2244/14, Morris Motors Account, Letter from William Morris to Barclays Bank, 23 June 1936.

component industry, many firms turned to alternative forms of funding. The next section will analyse how firms extracted external finance by either forming 'private' joint-stock companies, receiving funding from family or friends and examining the key role of the clearing banks.

The Formation of Private Joint-Stock Companies

An alternative to capital raised by public floatation was the formation of 'private' joint-stock companies. Given the absence of company promoters and prospectus expenses, the conversion of a firm into a private joint-stock company was a cheaper option than applying to the capital markets. Here, capital would be raised privately from investors who were not hitherto directly connected with the financing and management of the business. This was an extremely popular method of raising capital in the cycle industry, especially during the 1890s. Harrison has calculated that well over 100 'private' joint-stock companies were formed in the main cycle making centres, Coventry, Birmingham and Nottingham, between 1870-1914.[34] The issuing of shares privately, placed a heavy reliance on local family, personal and business connections, and consequently the number of shareholders were usually small in total. In fact, seven shareholders was the statutory minimum for joint-stock companies and few cycle, or car component firms exceeded this figure. Moreover, the local and small scale nature of this

[34] Harrison is one of only a few historians to analyse and define the role of these 'private' joint-stock companies, see Harrison, 'Joint-Stock Company Flotation', p. 171.

method of raising additional funds, ensured that investment levels were relatively modest, often not more than £10,000.[35]

The Coventry Stock and Shares List, published by the Coventry stock brokers T.M. Daffern, reveals that throughout the period under study, a number of firms sought to raise capital through the private issue of shares. Since the car component industry had been closely connected with the cycle industry, the cycle boom of the late nineteenth century and the subsequent clamour to raise capital through private-joint stock companies, ensured that there were a number of Coventry firms which had derived external funds in this manner. Indeed, prior to the First World War, most of the 'private' joint-stock companies had been formed during the 1890s when they had been trading as cycle component firms. Firms such as Automachinery, Brett's Stamping and Coventry Watch Movement Company, were all fairly small concerns (all had capital of less than £20,000) and had been formerly engaged in the cycle trade. Moreover, although the small scale of these firms rendered them unsuitable for floatation on the stock exchange, the owners of the firms often preferred the 'private' issue of shares since it allowed families to retain control of the business. For example, by the early twentieth century William Hillman, provided the vast majority of capital for his business interests, and only occasionally issued small allocations of private shares.[36] As with the public floatation of firms on the stock exchange,[37] the call for private investors, through the medium of *The Coventry*

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[35] *Ibid*, p. 171.
[36] Colindale Newspaper Library, *The Coventry Stock and Share List*, 1901-1914, Thoms and Donnelly, *The Motor Car Industry*, p. 56.
[37] Harrison, 'Joint-Stock Company Flotation', p. 168.

Stock and Share List, coincided with boom periods in the motor industry. The 1920s and the mid 1930s, witnessed an increase in newly established component firms, requesting additional capital through private investors. Many of these firms, unlike the earlier period, had possessed no previous connection with the cycle industry. However, the striking feature of the new capital issues advertised in the *Stock and Share List* was the modest amounts of capital that firms required. For example, in 1923, J.A. Barnes Accessories issued new capital of only £1,000 and Godiva Engineering requested additional capital of £5,000. Indeed, the *Stock and Share List* reveals that most new capital issues by private car component firms were under £10,000. Table 4.1 lists the known private Coventry car component firms which advertised new capital issues between 1932-1939. Although this list can not be regarded as a comprehensive listing of all private shares issued, it does indicate the proportion of capital required by component firms and the extent to which this facility for raising capital was utilised.

Table 4.1

Private Coventry Component Firms which Issued New Capital to External Investors Between 1932-1939.

Year	Firm	New Capital Issued
1932	Boyce Motor Accessories	£1,500
1932	Swallow Coach Building	£20,000
1932	Midland Motor Body Company	£10,000
1932	United Motor Accessories	£200
1932	Safety Bumpers Ltd	£10,000
1933	Hobely Brothers	£1,000
1934	Coventry Hood and Sidescreen Ltd	£1,000
1937	Avon Bodies	£3,000
1937	Modern Headlights	£10,000
1939	Butlin Coachbuilders	£1,000
	Average New Capital Issued	**£5,770**

Source: Colindale Newspaper Library, The Coventry Stock and Share List 1932-1939.

Table 4.1 shows that whilst there were a number of firms issuing new capital to external investors between 1932-1933, this strategy of raising capital for private companies was not widely adopted within the component industry. Moreover, the sums involved were also extremely modest since the average figure for the ten firms reached only £5,770. The small amount of new capital issued also indicates that most of these firms applying for external funding were unable to utilise bank finance, or close family and friends and had to resort to tapping the Coventry business community for funds. Thus United Motor Accessories' issue of £200 private shares suggests that the firm possessed a very modest working capital and were unable to procure any other financial support. However, firms which attempted to raise quite substantial sums of new capital, such as Swallow Coach Bodies and Midland Light Bodies, may have enjoyed a good standing and extremely good connections within the local business community. Swallow Coach Bodies, which was established in Blackpool in 1922, developed a close working relationship with Standard after moving to Coventry in 1928.[38] Likewise, Midland Light Bodies had become an established firm by the 1930s and was owned by the Riley family who were involved in a number of business ventures in Coventry.[39]

An investigation into the extent to which firms were converted into joint-stock companies to utilise private capital has revealed that, although this was an important form of raising capital for some firms, the practice was not widespread. Thus both the capital markets and private issues of shares were not commonly

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[38] Thoms and Donnelly, *The Motor Car Industry*, pp. 99-100
[39] Morewood, *Pioneers and Inheritors*, pp. 7-8.

utilised since it seems that entrepreneurs within the Coventry car component industry were reluctant to acquire finances from outside sources. The following section will analyse the most prevalent form of company finance in the Coventry component industry - family, friends and the business community.

Family, Friends and the business community as a Source of Finance.

Since the majority of Coventry car component firms were small units of production, most firms owed their existence to capital supplied by families, friends and contacts within the Coventry business community. The pledge of family guarantees in establishing or expanding existing firms was an important way of extracting support from financial institutions.[40] This was perhaps the most common form of entry into the car component trade, which ensured that wealthy families simply injected the initial capital or provided the guarantee for bank loans for younger members of the family to enter into a new line of business. Alick Hill, for example, the son of a Chapelfields watch maker, used £300 of his family's wealth to establish Coventry Chain to manufacture chains for cycles and motor cars in 1896. Family guarantees, mainly from his father Charles John Hill, enabled the firm to expand from its small workshop in Dale Street to larger premises and increase the capital from £300 to £8,008 in 1902.[41] Similarly, the White family, who had also

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[40] See the next section of this chapter.
[41] PRO, BT31/9785/72901, Coventry Chain, List of Shareholders and Directors 1902.

accumulated their wealth through the watch trade, were the financial source for White and Poppe the engine makers. With the establishment of White and Poppe in 1899, the Lloyds bank manager noted that he believed 'old J. White is at the back of this'. Consequently, in 1900 when his son, Alfred White, requested a loan for £2,000, the bank manager would only agree if 'Mr White Senior, who is well off, guaranteed the loan'. Thus between 1899 to 1907, White and Poppe were able to extend their overdraft facility to over £10,000 through citing J. White's financial guarantees.[42]

It was the funding derived from family sources which enabled Walter Payne to convert his business from a gas engine firm to a motor engine and vehicle manufacturing concern. Payne had established his firm, Godiva Engines, in Castle Street, Coventry in 1890. However, the firm was under-capitalized, and in 1897, Payne went into a business partnership with his wife's uncle, George Bates. Payne's son recalled in 1946, how the firm Payne and Bates had materialised.

> George Bates, my mother's uncle, saw that dad was on a good thing and offered to put a large sum of money into the business for dad, his son Henry Bates and himself on the condition that they had a factory built at Great Heath Foleshill and the firm be called Payne and Bates.[43]

However, just as the Bates family had provided the capital to found the business, the family was also to play a leading role in its demise. Just five years after the firm's foundation, a motoring accident led to the death of George Bates, and

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[42] Lloyds Bank Archive (hereafter LBA), B379a/11, 5 October 1899, 27 June 1900 and B379a/16, 25 November 1907.
[43] London University, Senate House Library, Pollit Papers Book 1, 8/108, Letter to Pollitt from F.S Payne, 25 February 1946.

consequently, the Bates' family decided to wind up the company and sell the factory, a process accomplished by 1902.[44] Likewise, it is doubtful whether the formation of Pistons Ltd could have occurred without family backing. The founders of Pistons, Harry Parsons and Frank Bullock, received the initial capital of £500, from C.H. Doley, Parsons' father in law, who owned a brass founding business in Birmingham. Furthermore, Doley provided the funds when Bullock decided to leave the business and establish Valves Ltd in 1916. The Midland Bank manager noted that 'Mr Parsons called with Mr Doley, who banks at the Birmingham branch and stated that they had paid out Mr Bullock £500...' Doley acted as the company's guarantor during the formative years of the company until Pistons received a substantial order from Ford in the late 1920s.[45] Morris and Lister, the founders of ML Magneto were also forced into asking for some financial assistance from family relations after the Lloyds bank manager refused an extension to their overdraft. In 1908, the company experienced financial problems since the concern's sales had not been sufficient to cover the experimental costs of a magneto patent which they estimated could be worth up to £5,000. However, this did not impress the bank manager and subsequently they were compelled to borrow on a regular basis small sums of money of around £100 from Morris' brother to pay the wages .[46]

Along with family backing, entrepreneurs drew financial support from friends or contacts within the Coventry business

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[44] C. O'Gallagher, 'Payne and Bates of Coventry: Pioneer Motor Manufacturers', *Warwickshire History*, vol 3, 1975, p. 83.
[45] MBA, 358/7, 17 January 1916. Taped interview with G. Parsons 16 October 1992.
[46] LBA, B379a/17, July 31 1908, 25 January 1909.

community. For example, William Hillman, the founder of Automachinery, could not rely on financial assistance from his family since his father was a shoemaker with limited resources. Born in Stratford, Essex, in 1848, Hillman trained as an engineer at John Penn and Company of Greenwich, before moving to work at the Coventry Sewing Machine Company in Cheylesmore. The success of Starley's 'safety bicycle' prompted Hillman to established Automachinery in 1876 to manufacture nuts, bearings and steel balls. However, since he lacked sufficient financial resources the company was in fact a partnership with a close friend, William Henry Herbert. Herbert, who was the brother of Alfred, the Coventry machine tool manufacturer, had been given the capital from his father, a Leicestershire builder and farmer.[47] Although Hillman and Herbert were the principle shareholders, Automachinery's remaining investors reflected the component industry's close links with the regional economy. Thus, of the eight shareholders listed, six were connected with the cycle industry, one was a local solicitor and one a silk manufacturer.[48]

It seems unlikely that Van Raden and Company would have survived if it had not been for the financial backing of Vaughan Robinson, a Coventry solicitor. The Robinson family derived its wealth from agriculture since Vaughan's father was a dairy farmer with an estate worth over £130,000 in 1913.[49] Although it is unclear why the Robinson family should want to invest in Van Raden, it is evident that the venture was entirely the idea of

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[47] D.G. Rhys, William Hillman', in D. Jeremy (ed), *The Directory of Business Biography*, 3, (1985), pp. 245-247.
[48] PRO, BT31/3813/23928, Automachinery, List of Shareholders and Directors 29 March 1887.
[49] LBA, B379a/20, 27 December 1912.

Vaughan Robinson who effectively took control of the company in 1903. Both his father and the Lloyds bank manager had grave reservations concerning the risks in entering an industry in which there was a rapid change in demand and technology. In 1907 the bank manager noted that J. Robinson (Vaughan's father) 'thinks Vaughan Robinson will lose a lot of the family's money in this concern, as there is not sufficient management, and asked me if I could warn him about this in a fatherly way'.[50] Robinson's cash injections and financial guarantees permitted Van Raden to secure an overdraft limit of £15,000 in 1908. This loan was to prove central in expanding their range of electrical car components. The capital was used to pay advance royalties to a French company, which enabled Van Raden to commence the manufacture of magnetos. However, during the Robinsons' association with the Van Raden Company, the bank manager was constantly advising the family to sell the business since he had 'never seen such losses...and if it was not for the old connection I should at once demand the overdraft'.[51] It was almost certainly on the advice of the bank manager that Vaughan Robinson sold the business in 1919 to Robert Rankin and John Percy Starley, two former electrical engineers from Pritchard and Gold a London based company.[52]

An analysis of the board of trade files, which provides details of the shareholders of firms, demonstrates that after funds derived from families, contacts within the Coventry business community were the most significant form of gaining financial support. Indeed, within the Coventry business community a

[50] LBA, B379a/16, 31 October 1907.
[51] LBA, B379a/16, 12 November 1907, B379a/17, 27 January 1908.
[52] Taped interview with Mr Eric Starley, 2 October 1992.

number of prominent figures emerged who possessed financial interests in a number of Coventry car component firms. For example, W.A. Oubridge, who had established British Piston Rings in 1911 through money supplied from his father, was by 1919, providing finance for the establishment of other component firms in the city. Valves Ltd, which had been founded by Frank Bullock in 1916, relied heavily on Oubridge after the Midland Bank manager urged Bullock to increase the firm's capital in 1919. Bullock raised the capital from £650 to £1,010, by persuading Oubridge to supply 85 per cent of the fresh capital.[53] Oubridge was also the main financial backer behind Holbrook Bodies which was established in 1920. Moreover, Oubridge also played a role in the body firm's demise when he withdrew his financial support in 1930, after the firm had experienced a series of heavy losses between 1927-1930.[54] Other prominent businessmen who were actively involved in funding several component firms included Alfred Bednell, W.N. Lindley and Victor Riley.[55] Alfred Bednell, the leading company-agent financed a number of different component firms during the interwar period. For example, Bednell was one of the main investors in the re-construction of the Holley Brothers Firm, the American owned carburettor manufacturer. The capital was raised from £10,000 to £25,000 through securing financial assistance from three individuals, Alfred Bednell, Harry Smith of Rover and T.G. John of the Deasy car firm.[56] A year later, H.J.C Warren and W.H. Bennett, the owners of the General

[53] MBA, 358/12, 15 November 1919.
[54] CRO, Acc 606, Daffern and Stephenson Collection, Holbrook Bodies balance sheets and directors' reports 1929-1930.
[55] See also chapter 5 on directorships in the component industry.
[56] MBA 358/6, 15 October 1918.

Accessory Supply Company, successfully convinced Bednell to invest £1,000 into the business. The firm was founded in 1919 with a capital of only £486, since the two owners were described as 'practical engineers' with very limited financial resources.[57] Likewise, W.N. Lindley's investment into the Coventry car component industry was instrumental in setting up two firms and re-constructing a third prior to the First World War. Lindley, a wealthy local solicitor, made substantial financial commitments in Coventry Climax when it was established in 1904, and the British Piston Ring Company when it was founded in 1911. Indeed, Lindley was appointed company secretary at both British Piston Ring and Coventry Chain, the firm which he invested in after it was floated in 1907.[58] Another significant financier of component firms was Victor Riley who between 1900-1939, had interests in at least four different component firms. During the early years of the twentieth century, Riley established Riley Engine Company in 1903, and invested almost ten per cent of the £2,000 capital of the newly established Albion Drop Forgings.[59] After the First World War Victor Riley, along with his brother Allan, established the Midland Motor Body Company with a capital of £10,000, and the Nero Engine Company with a share capital of £5,000 in order to safeguard body and engine supplies to the Riley car manufacturing firm.[60]

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[57] PRO, BT31/24332/152600, General Accessory Supply Company, List of share holders and directors, 13 January 1919, 19 October 1920.
[58] LBA, B379a/14 23 December 1904, B379a/19, 2 August 1911, MCL, M501/650.0124/CC902/1f, Renold Chain Archive, Coventry Chain Minute Book 1902-1931, 5 April 1907.
[59] S. Morewood, *Pioneers and Inheritors*, pp. 7-8, LBA, B379s/15, 12 November 1905.
[60] PRO, BT31/264817/33335, Midland Motor Body Company, List of shareholders and directors, 1932, BT31/22012/133567, Nero Engine Company Ltd, List of shareholders and directors, 26 January 1914.

There was also a significant number of firms which succeeded in attracting capital from individuals who had previously been unconnected with Coventry's engineering and textile industries. In 1908, Hewer Car Bodies was established with a capital of £2,357. Whilst one of the firm's directors, A.A. Wincott a Coventry builder, possessed the largest single shares of £501, other large share holders comprised of H.B. Craig, a Gentleman in Ireland with £500 shares and W.J. Leonard a Gentleman from London who had invested £300 in the firm.[61] A firm which successfully acquired capital from outside the Coventry business community was Thomas Pass Limited. Although, Thomas Pass was an old-established body building firm, it required additional capital to expand its motor vehicle body shop. In 1919, the firm increased its capital from £2,000 to £4,000, courtesy of an investor external to Coventry. It is quite possible that Thomas Pass had persuaded one of his suppliers to invest in the firm, since the shareholder which had increased the capital by £2,000 was named as J.R. Remer an M.P. and timber merchant from Liverpool.[62] Finally, Charles Forman, who established Forman Motor Company in 1903 with a capital of £1,425, was financed almost entirely by London based investors. The largest shareholder was named as A. Cleverland who possessed £950 of the share capital and also occupied a position on the board of directors.[63]

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[61] PRO, BT31/11828/91871, Hewer Car Bodies, List of shareholders and directors, 14 August 1908. Coventry University, Lanchester Oral History Archive, Mr A.T. Farrer, 24 August 1982.
[62] PRO, BT31/3122138/134614, Thomas Pass Limited, List of shareholders and directors, 30 June 1914.
[63] PRO, BT31/10263/77079, Forman Motor Company, List of shareholders and directors, 20 April 1903.

An important form of financing a firm, which did not require wealthy family, friends or business contacts, was through debentures. Debentures carried a fixed rate of annual interest as a means of attracting investors from individuals and were also favoured by banks as security. Financiers were also attracted to invest in debentures, since until the 1929 Companies Act, debenture holders took priority in the distribution of the assets of a business in liquidation. This was perhaps one of the reasons why entrepreneurs were not overly keen to have their businesses financed in this way as an element of control was passed over to the debenture holders. Indeed, many firms were to fold through the actions of their debenture holders.[64]

The vulnerable position of component firms to unscrupulous debenture holders was demonstrated by the fortunes of Johnston, Hurley and Martin. In 1903, the three men, whom the Lloyds bank manager noted 'were all practical men', left the Forman Manufacturing Company, as they felt 'Forman was no good at all' and established JHM to manufacture motor engines.[65] However, evidence suggests that they lacked Forman's financial resources and so acquired an injection of capital through the debenture system. In 1910, JHM's largest customer, Calthorpe Motors, attempted to take-over the firm by underhand methods which the Lloyds bank manger described as a 'shabby trick'.[66] Mr Hands of Calthorpe, who was a debenture holder in JHM, let his monthly interest accumulate and then, during a period in which Calthorpe had delayed payment of its monthly account, Hands put in a

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[64] S. Morewood, *Pioneers and Inheritors*, p. 17.
[65] LBA, B 379a/11, 15 April 1903.
[66] LBA, B 379a/19, 29 September 1910.

claim for his debenture interest. A furious Hurley reported to his bank that:

> they would have been a good deal better without the Calthorpe Company and that Hands, the solicitor and the auditor leagued together, thinking that they could not pay the debenture, and the concern would be in Hands' power at his own price...[67]

This failed take-over bid ensured that JHM became extremely cautious in their dealings with Calthorpe, only supplying the firm with one engine per week and never allowing more credit than a £150 a month to accumulate.[68]

There can be little doubt that, for the vast majority of Coventry car component firms, family, friends or contacts within the business community were the prevalent sources of funds for firms entering or expanding an existing business within the industry. Indeed, not only were firms able to obtain capital from these sources, but they frequently called upon family, friends or business associates to act as guarantors for bank overdrafts. The important role the banks' played in the car component industry will be the subject of the following section. Here, analysis will focus on the criteria adopted by the clearing banks when dealing with overdraft requests in a bid to determine the relationship between the component industry and the banks between 1895-1939.

The Role of the Clearing Banks

The clearing banks played a critical role within the Coventry car component industry. The small scale nature of the industry

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[67] Ibid, 11 October 1910.
[68] Ibid, 29 May 1911.

ensured that many firms relied on the support of banks to remain in business. Such firms were consistently plagued by cash flow problems since they found it almost impossible to accumulate a reserve fund. Thus, Midland Bank's refusal to extend Priory Accessories overdraft beyond its £100 limit was a significant factor in the firm's failure after it was unable to meet debts of between £3,000/4,000 in 1915.[69]

However, in other cases, banks were more flexible with their customers' requirements. In 1906, E.J. Hardy, after consulting his accountant, demanded that Lloyds reduce its bank charges. Despite R.H. Ragg's (the bank manager) comments that he 'thought it was a pity these accountants did not mind their own business, and had told them so', he relented and reduced the bank charges on the condition that Hardy 'kept the matter strictly private'. The business had grown in strength since its foundation in 1906, and clearly, Ragg feared that Hardy might transfer his account to Midland Bank unless Lloyds accept his demands.[70] Consequently, the willingness of a bank to accommodate their customers rested upon the circumstances surrounding the firm. To analyse effectively the nature of these circumstances, the following section will examine the criteria adopted by banks in offering or declining component firms financial support.

In order to examine the nature of the banks' policy towards Coventry car component firms, a search was conducted of lending policy decisions recorded in the daily journals and the head office meetings of Lloyds and Midland Banks. Between

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[69] MBA, 358/7, January 1915.
[70] LBA, B379a/15, 13 October 1906.

them, Lloyds and Midland Banks were the main financial institutions dealing with Coventry's industrial sector between 1895-1939.[71] Consequently they represent an ideal case from which to base an analysis of the relationship between the car component industry and the banks. A table was constructed of the lending patterns of Lloyds and Midlands Bank by selecting five significant lending policies and recording the number of occasions the policies were adopted in their dealings with 26 component firms.[72] The six chosen overdraft policies were; renewal a formality, renewal refused, security required, unsecured overdraft sanctioned, reduction of overdraft demanded and the banks' intervention into a firms' business practices. The final policy included circumstances when bank managers would offer advice or actively intervene in business decisions that were not directly connected with the issue of overdraft requests. In such circumstances, bank managers would insist upon regular interviews with their clients and the submission of periodic figures.[73]

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[71] Information supplied by Dr John Booker, Archivist Lloyds Bank.

[72] A similar research methodology was employed in an analysis of the banks' lending patterns to industry see D. M. Ross see 'The Clearing Banks and Industry', p. 58.

[73] Although this table provides a useful insight into lending patterns, there are a number of problems associated with research of this nature. The presence of a policy decision in the sample is a reflection of the availability of the records. For example, the records for Lloyds' Coventry branch exist only to 1918, and consequently, for the years 1919 to 1939, Lloyds' head office minute books, which were less detailed than the branch documents, were consulted. Also the table analyses the number of occasions in which particular types of lending policies were made, and therefore does not take into account the number of times a firm is represented in the survey.

Table 4.2
Some Observations on Lloyds and Midland banks' Relationship with Coventry Car Component Firms, 1895-1939.

Lending Policy	***Number of Occasions***
Renewal a Formality	0
Renewal Refused	8
Security Required	20
Unsecured Overdraft Sanctioned	5
Reduced Overdraft Demand	2
Intervention into Firm's Business Policy	20

Source: Lloyds and Midland Bank Archives, Daily Journals and Head Office Minute Book (Lloyds), 1895-1939. From the 26 car component firms included in the sample, there were 12 firms banking with Lloyds and 14 with Midland.

Despite its limitations, the table does provide insights into the pattern of overdraft sanctions adopted by Lloyds and Midland Banks. The fact that not one case of automatic overdraft renewal was recorded or that there were only five cases of unsecured loans offered, indicates that the banks viewed the car component industry with some caution. Clearly, the most important consideration when a bank manager was dealing with a request for an overdraft was whether a firm possessed the ability to provide security. The banks would accept a variety of securities from firms, including insurance policies on director's lives, mortgages on premises, personal or combined guarantees and debentures. The Lloyds and Midland Bank archive revealed that 36 per cent. of the lending policy decisions requested some form of security, whilst 16 per cent of firms were refused renewals. Moreover, the final row on the table demonstrates that after granting overdrafts, banks would actively shape a firm's business decisions to safeguard their loan. Moreover, during the course of research it became apparent that neither

Lloyds or Midland radically altered their lending policy between 1895-1939.

This analysis of quantitative evidence relating to the banks' lending patterns is supported by a more qualitative analyses of the banks' interviews with customers recorded in the daily journals. The most frequent type of financial support offered by the banks came in the form of an overdraft facility. Moreover, for many component firms which were too small to publicly float or were unable to tap the Coventry business community for funds, the bank overdraft was their only access to external capital. Consequently, overdrafts could amount to large sums of money. In 1911, Coventry Chain secured an overdraft for £30,000 from Midland Bank whilst, in 1912, White and Poppe was sanctioned a £16,000 limit by Lloyds to alleviate a potentially crippling cash flow problem.[74] Although there was not a formal set of guidelines that firms had to meet to secure an overdraft, the banks did possess a general criteria in evaluating a firm's creditworthiness. Bank managers would investigate three major areas of a firm's business before deciding to grant an overdraft request; the firm's prospects and product strength, capital, and the quality of management.[75] In exploring these areas, the bank manager would often have possessed a unique insight into the running of a firm. With regard to product strength, for example, R.H. Ragg (the Lloyds manager), consistently refused Van Raden an extension to its existing overdraft in 1907 after the firm's management admitted

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[74] MBA, 358/9, 17 November 1911, LBA, B379a/20, 3 April 1912.
[75] Thoms and Donnelly have identified a similar criteria used by banks when assessing the credit worthiness of car assemblers during the same period. See Thoms and Donnelly, *The Motor Car Industry*, p. 58.

that they 'hadn't got a magneto...only accumulators which were out of date'.[76] On the other hand, if a firm was marketing a strong product the bank manager was more forthcoming in facilitating an overdraft. In 1911, R.H. Ragg agreed to an overdraft of £100 to the British Piston Ring Company. Although it was only in its first year of trading, Ragg noted that 'it was a splendid business' and that W.A. Oubridge (the owner and manager), 'works very hard and says that the piston rings are the best on the market, which the demand seems to prove'.[77]

However, a strong and marketable product was not in itself sufficient to persuade a bank manager that a firm was credit worthy. One of the most common reasons why firms were refused an overdraft or an extension to their limit was the size of the capital. As the first section of the chapter demonstrated, it was common for many firms in the car component industry to possess small sums of capital. Moreover, it was highly unlikely that these firms would have had access to substantial guarantees to cover an overdraft request. A typical firm in this position was Doherty Motor Accessories which was founded in 1902. Despite receiving an order worth between £4,000 to £5,000, the bank manager, while admitting that there 'was a great prospect for them', declined to offer Doherty an overdraft on a capital of only £200. Ragg noted in his daily journal that:

> no bank would allow £100 to £150 on so small capital, but would do it on a good guarantee...If they require £10 or £12 occasionally for wages for a few days, I said they could have it...

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[76] LBA, B379a/16, 31 October, 12 November 1907.
[77] LBA, B379a/19, 1 June 1911.

Indeed, after Doherty admitted to Ragg that no guarantee could be found, the bank manager advised the owners to sell the business to solve the cash flow problem.[78] Similar capitalization problems had beset Sterling Metal Ltd in 1911. The firm, which had secured a large contract to supply engine castings to Daimler, was refused an overdraft of £6,000 by the Lloyds Bank manager. Ragg considered that the firm's £10,000 capital was too small and informed them 'not to go too fast as they must be aware that the non success of several of the Coventry firms' was due to receiving orders 'too large for their normal business'.[79] Problems were compounded for a firm which possessed a very small capital and lacked guarantees since the banks would often refuse even the smallest overdraft facility. In 1908, Cromwell Engineering, which possessed a capital of only £100, was refused a small overdraft of between £10-£20 by Ragg who advised them 'to get a good guarantee or better to borrow it from a friend'. Nevertheless, firms such as Cromwell, which were reliant on banks for small sums of money, were almost certain to have been forced into overdraft requests of this nature only after fruitless efforts of attempting to acquire capital from family or friends.

However, such was the nature of the Coventry car component industry, firms which had little or no access to external funds required the use of an overdraft as a matter of necessity. The seasonal nature of the motor industry and the car assemblers' practice of demanding substantial credit from their suppliers

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[78] LBA, B379a/12, 9 November 1902.
[79] LBA, B379a/19, 27 October 1911.

pushed many component firms to the brink of bankruptcy.[80] Both Coventry Motor and Sundries in 1922 and Coventry Motor Fittings in 1935 were forced into requesting an extension to their overdraft limits after car assemblers had delayed their payments.[81] Unlike car assemblers, the weak position of many component firms ensured that they were often unable to negotiate credit arrangements with their suppliers of raw materials. Thus in 1914, Ragg noted that although Sterling 'were doing exceedingly well' they 'were always up to the limit...due to the fact that they are buying metal to the utmost of their capacity'.[82]

Another important consideration for the bank when dealing with overdraft requests was whether the business was under efficient management. The local bank manager would often know the owners personally, and could therefore assess the quality of management. An analysis of the daily journals of both Lloyds and the Midlands Bank demonstrate that throughout the period 1895-1939, branch managers frequently referred to the management of component firms. Two firms which were constantly criticised by Lloyds for possessing poor management were Doherty and Van Raden. In 1905, Ragg refused an extension to an overdraft on the grounds that Mr Page of Doherty Motor Accessories was 'no good as works manager, instead of getting there at 6.30am, he gets there at 9.30am'.[83] Likewise Ragg and his successor, E.A. Raybould, became increasingly concerned with the management of Van Raden

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[80] B. Beaven, 'Growth and Significance of the Coventry Car Component Industry', p. 114. Also see Chapter 7.
[81] MBA, 358/9, 6 June 1922, 358/13, 7 November 1935.
[82] LBA, B379a/19, 12 February 1914.
[83] LBA, B379a/14, 20 October 1905.

between 1906-1918. In 1906, Ragg expressed his first doubts about Van Raden's ability to manage when he noted that he 'would ruin a good business if he backed so much up in stocks and book debts'. In 1908, Ragg continued to criticise the management of the firm by pointing out that 'the salaries and dead expenses were actually as much as the sales and told him [Van Raden] that it was like putting money down a drain'.[84] Consequently, Lloyds' refusal to extend Van Raden' fairly small overdraft limit, ensured that the firm's owners, the Robinson family, were constantly required to finance the concern. Conversely, if the customer possessed a good reputation in the Coventry business community and was on friendly terms with the branch manager, then there was a strong likelihood that an overdraft facility would be granted. A personal understanding between the owner and bank manager was critical for a component firm that had recently been established since funds were often small. Alick Hill, whom the Midland Bank manager regarded as 'thoroughly capable man',[85] noted in his reminiscences that it was imperative that he remained on friendly terms with the manager of Midland Bank:

> I will perhaps tell you some day of the pleasant (?) feelings engendered by having to interview the bank on Friday morning when the wages to be paid amounted to some £50 and only about £20 stood to my credit in the bank. However, my experience shows that in starting a new industry in one's native city good wishes and goodwill are even better assets than cash in the bank...[86]

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[84] LBA, B379a/15, 30 July 1906, LBA, B379a/17, 11 September 1909.
[85] MBA, 358/5, 18 April 1907.
[86] MCL, M105/331.84/CC919/11, Renold Chain and Coventry Chain Archive, *The Link. The House Magazine of the Coventry Chain Co*, April 1919, Vol 1, no1, (Coventry), p. 3.

Moreover, in 1923, the Midland Bank branch manager took the unusual step of sanctioning an overdraft request of £2,000 to Frank Bullock, owner of Valves Ltd, without demanding sufficient guarantees to cover the loan. The bank manager explained his decision to head office by stating that his brother was William Bullock, the managing director of Singers, who was 'possessed of considerable means'.[87] Ten years later, the bank appeared to have continued with a similar policy after allowing J.H. Butlin to found his own firm in 1933 by sanctioning an overdraft of £1,700. The justification for granting an overdraft to a firm in its infancy was based partly on securities offered, but also because Butlin was a former manager at Charlesworth Bodies and had a 'good reputation'.[88]

Although the bank manager performed an observational function in assessing a firm's product strength and prospects, capital and the quality of management, the bank manager would often take on a more interventionist role after an overdraft had been sanctioned. The sole motive for banks attempting to shape the business policy of motor firms was to protect their original loan or to improve the nature of their security. For example, Midland Bank demanded that Rover sell off one of its body suppliers, Cheylesmore Sheet Metal, when the car firm entered into financial difficulties in 1932.[89] The banks were particularly keen to warn their customers in the dangers of selling debentures in the firm since it would put the bank's loan at risk. For example, the branch manager of Lloyds, R.H. Ragg, actively

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[87] MBA, 358/12, 31 October 1923.
[88] MBA, 358/13, 7 December 1933.
[89] University of Warwick, Modern Record Centre, MSS 266/RO/1/1/5, Rover Minute Book 1926-1936, 11 February 1932.

intervened in the business policy of British Piston Ring in 1911, threatening to withdraw all support for the firm if W.A Oubridge, the owner, raised capital through debentures. Ragg noted that:

> He requires at least a further £500 capital and suggested debentures. I strongly advised him to get his father to lend the amount in preference shares...I would lend him a hundred or two occasionally, but nothing if debentures...

With the bank's threat of removing the facility of an overdraft, Oubridge had little option but to alter his business policy and adopt Ragg's advice.

In 1908, Lloyds also intervened into the business practices of Johnston Hurly and Martin (JHM). Established in 1903, the firm had survived the intense competition in the engine manufacturing sector of the industry by trading almost solely with the Calthorpe Car firm in Birmingham and allowing generous credit terms. Worried that the bank's loan was at risk, despite large order books, Ragg warned JHM that no extension to their limit would be sanctioned unless they demanded 'cheques either weekly or monthly, as if they stopped the supply of engines the company cannot manufacture'. However, once this policy had been enforced upon JHM, Calthorpe reduced its orders significantly, placing the engine supplier under further financial pressure. By 1913, JHM was in serious financial trouble, a situation which prompted Johnston to resign after it was revealed that the firm hand accumulated debts of nearly £2,000.[90] In other cases, it was not the threat of removing a overdraft facility that shaped a firm's business policy, but the conditions set by the bank when sanctioning it. For example, in

[90] LBA, B379a/17, 12 December 1908, B379a/20, 4 April 1913.

1902, William Hillman of Automachinery secured a substantial loan from Lloyds on the condition that he re-organised the management of the firm. In the following year, after a meeting with William Hillman, Ragg noted in his daily journal that:

> He said that about twelve months ago the business was going back and he dismissed the manager and since he's looking after it himself it has been considerably improved and they are now doing well.[91]

Thus, in assessing whether a component firm was credit worthy, both the Lloyds and Midland Banks possessed considerable autonomy over lending decisions and exercised a degree of influence in the customer's business policy. However, local branch managers were not free from the constraints of head office. Although head office would automatically deal with larger overdraft requests, they would actively intervene if they felt that the local branch manager was treating a firm too leniently. In 1932, Coventry Motor Panels was refused an extension to its overdraft after head office had complained that it was 'disturbing to find these customers have made a loss of over £3,500'. The local branch manager had been fairly generous with the firm since the bank possessed guarantees of only £1,000, whilst the overdraft account had risen from £881 in 1923 to £1,745 in 1928. Meanwhile, the capital of the firm had remained static at only £994 throughout the period.[92] Another firm which came under close supervision from Midland Bank's head office was Valves Ltd. On a number of occasions between 1927-1933, the local branch manager was instructed by head office to refuse the firm further extensions to its limit,

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[91] LBA, B379a/12, 10 February 1903.
[92] MBA, 358/7 11, February 1932.

fearing that good connections within the motor industry were not sufficient justification. With a capital of only £1,500, Valves relied heavily on an overdraft facility, a reliance that did not please head office. In 1927, head office attempted to shape the firm's business policy by rejecting an extension to an overdraft which had already exceeded £2,000 on the grounds that the management's wages were too high. Head office noted that 'what is proposed as regards reductions? They are paying the Managing Director £2,200 pa and £800 is paid away in dividends. This is not satisfactory while the overdraft is so heavy'. In 1931, head office once again rejected an overdraft extension which would have increased the limit to £9,000. Without the overdraft, Valves were unable to meet their existing orders and consequently, the bank's decision forced Frank Bullock to secure external funds, thereby reducing some of his control in the firm.[93]

The very fact that the component industry was based upon small scale units of production ensured that the clearing banks had a large role to play in the establishment and functioning of a firm. With the supply of capital often limited to family and friends the overdraft facility was a necessity for many firms. Moreover, the previous section has demonstrated that the banks were not adverse to lending fairly substantial amounts to component firms if they met an informal set of criteria. Indeed, the two main banks involved the Coventry component industry, appear to have continued to adopt the same lending criteria, which had an emphasis on product strength, the capital of the firm and the quality of management throughout the interwar

[93] MBA, 358/12, 18 November 1927, 26 June 1931, 24 October 1931.

period. However, firms which strayed from the path set by bank managers after a loan had been granted were often subject to the banks' intervention into the firm's business policy. Thus, not only were banks an important source of financial support, but they were also actively involved in shaping the business policy of many car component firms.

Conclusion

The analysis of the sources of finance which were available to Coventry car component firms has addressed some important issues surrounding the relationship between British industry and banks during the interwar period. There has been a sizeable body of opinion which has concluded that the capital markets and the banking system failed British industry. The accusations made against Britain's financial institutions rest upon the assumption that the capital markets and banks neglected British manufacturing industry in favour of investments into more profitable overseas projects. Indeed, many historians have cited the banks' treatment of manufacturing industry as a major reason for Britain's economic decline during the twentieth century.[94] Evidence drawn from the Coventry car component industry has demonstrated that the vast majority of firms did not issue shares to the capital markets and instead were financed by families, friends or business contacts. However, how much was this a reflection of the lack of demand for this type of finance?[95] Certainly, there existed a preference among car component firms

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[94] Collins, *Banks and Industrial Finance in Britain 1800-1939*, (1991), p. 33.

[95] P.L Cottrell, *Industrial Finance 1830-1914. The Finance and Organization of English Manufacturing Industry*, (1980), p. 296.

to rely on internally generated funds. Nevertheless, this does not explain the difficulties faced by a company in the 'new industries' when attempting to raise finance through the capital markets. Thus the car component industry, which was small scale and deemed unsuitable for public floatation, had little option but to follow in the tradition set by small car firms and extract external funding through the clearing banks.[96] Recently, the role of the banks in British industry has been re-appraised. Ross has defended the banks by claiming that they were far from the passive partners with industry which some historians have suggested, but were in fact, lending substantial amounts to British manufacturing firms.[97] To some extent, the analysis of the Coventry car component industry supports this view, as a high proportion of firms relied heavily on the overdraft facility. However, the criteria adopted by banks in assessing the credit worthiness of a firm and the nature of the loan itself were geared towards short-term aims. Banks were unwilling to provide finances for capital projects, and consequently, the prevalent form of finance offered by banks was the overdraft facility.[98] Indeed, bank loans were granted only if firms met the banks' informal criteria and were subject to twelve month reviews. Moreover, the banks played a more active role in industry only after a firm had been granted an overdraft, and when there appeared a risk to the bank's investment. Thus, business policy was shaped, not through objectives which would

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[96] A.E. Harrison, 'F. Hooper and Co. The Problems of Capital Supply in the Cycle Manufacturing Industry, 1891-1914', *Business History*, 24.
[97] Ross, 'The Clearing Banks and Industry', p. 65.
[98] Thoms and Donnelly, *The Motor Car Industry*, p. 58. See also M.H. Best and J. Humphries, 'The City and Industrial Decline'. These authors also note the short-term investment policy of British banks.

necessarily enhance the firm within the component industry, but with the ultimate short-term aim of safeguarding the bank's loan. While the banks cannot be faulted in supplying short-term finance to component firms in the shape of overdraft facilities, it is clear that no long term strategy was developed between the banks and component firms. Thus, the many component firms which possessed little or no reserves, were unable to expand their capital or invest in research and development projects, a situation which ensured that the industry continued in its small scale tradition.

Chapter 5

The Ownership and Management of Coventry Car Component Firms 1895-1939.

This chapter examines the ownership and management of Coventry car component firms between 1895-1939. A major objective will be to uncover the management structure of firms by analysing the size, composition and function of company boards. The study will also investigate whether owners appointed to key managerial positions formally trained staff or, conversely, their family or contacts within the Coventry business community. An overarching theme of the chapter will be to consider the role of the family firm in the component industry and whether their allegedly conservative business instincts ensured that car component firms remained small units of production. Indeed, the years between late nineteenth century to 1939 have been singled out by historians, such as Chandler, Payne and Lazonick, as a period in which the continued dominance of family firms gave British business a conservative outlook.[1]

Before the analysis drawn from primary source material can commence, it is necessary to note the methodological difficulties that analysis of the nature and function of a firm's managerial structure presents. A major methodological problem that emerged was the difficulty of uncovering and defining the different roles which directors and managers possessed. This

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[1] W. Lazonick, 'The Cotton Industry', in B. Elbaum and W. Lazonick (eds), *The Decline of the British Economy*, (Oxford, 1986), pp. 18-50. P.L. Payne, 'Emergence of the Large-Scale Company in Great Britain, 1870-1914', *Economic History Review*, 20, 1967, pp. 538-9. A. Chandler, 'Emergence of Managerial Capitalism', *Business History Review*, 58, (1984), pp.496-7

problem was not unique to the Coventry car component industry as Leslie Hannah has asserted:

> It is, in fact, more difficult in the British context than in any other to distinguish among a founding entrepreneur and his family, the financial interest, and the managerial interest, simply because these roles were not clearly differentiated in Great Britain.[2]

Indeed, in many cases, it was extremely difficult to differentiate between the owner and manager of a firm, especially when they were small scale family firms. In addition, in terms of categorising firms, this study will class small owner managed firms within the 'family firm' category since they shared many attributes in the structure and management of a firm. Another difficulty concerns the nature of the archive. Information on the composition of small firms without an extant archive proved difficult to procure. Whilst trade directories and *The Stock Exchange Year Books* listed board members, a more fruitful source was the Board of Trade papers held at the Public Record Office. The Board of Trade files contain lists of share holders and directors of firms which were founded or wound up during the period under study. Despite the fact that many files were randomly destroyed, this source provides a useful cross section of firms and reveals the occupation and residential location of entrepreneurs and shareholders involved in Coventry business. Indeed, the Board of Trade files along with trade directories, *The Stock Exchange Year Book*, business archives and various biographies and obituaries, were the primary sources for Table 5.1 While it is impossible to obtain information on all of the

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[2] L. Hannah, 'The Visible and Invisible Hands in Great Britain', *Managerial Hierarchies*, A.A. Chandler and H. Deams (eds), (Cambridge, 1980), p. 55

firms operating within the Coventry car component industry, the following evidence provides a useful insight into the managerial structure of the industry between 1895-1939.

The Structure of Ownership and Management

The desire to place the owners and managers of firms into an 'entrepreneurial failure' thesis to explain why the continued existence of small scale British firms between 1870-1939 has been a major preoccupation for some historians for the past thirty years. Indeed, Payne concluded that 'all too frequently the channels of advancement were blocked by family control'[3] while Habakkuk asserted that family control ensured that 'a constant haemorrhage of...ability from industry and trade into land ownership and politics'.[4] In the light of this debate it is pertinent to ask similar questions of the Coventry Car Component Industry. What was the nature of the ownership and managerial structure of firms and did its configuration put Coventry car component firms at a disadvantage to the American owned rival suppliers between 1895-1939?

Although the following tables do not contain information on all of the component firms between 1895-1939, the sample does provide a useful insight into the ownership and management structure of the industry. Most of the tables were derived from a data base containing 316 names of directors and share holders of seventy Coventry car component firms. Information was collected on the director's firm, residential location, occupation, social class, shares held, and whether they were founders,

[3] Payne, 'Emergence of the Large-Scale Company, pp. 538-9.
[4] H.J. Habakkuk, 'The Managerial Revolution: A Case Study', *The Listener*, 14 October 1954, pp.190-1.

inheritors or considered professional managers (see appendix 1). Surviving evidence was gleaned from the Board of Trade files along with trade directories, *The Stock Exchange Year Book*, business and bank archives and various biographies and obituaries. Given that an individual's inclusion in the study depended on the availability or reliability of the source material, the sample can not be claimed to have been selected 'randomly'. However, the sample does contain a cross section of directors and major shareholders from small, medium and large firms. There is, though, a bias towards smaller firms as they were numerically dominant in the Coventry car component industry during this period.[5]

Table 5.1 is a detailed analysis of the stated occupations of directors of Coventry component firms that were contained in either a firm's articles of association or share registration documents. From the sample of directors and major share holders (see appendix 1) a total of 184 directors had declared their occupation.

Table 5.1
Stated Occupation of Coventry Car Component Directors 1895-1939

Gentleman	*Solicitor*	*Car Manu*	*Component Engineer*	*Other*
9%	4%	8%	65%	14%

Source: Appendix II

Table 5.1 shows that 65% of directors connected with the car component industry described themselves as component

[5] Geoffrey Jones, used a similar methodology when encountering similar problems researching the foreign multinationals in Britain before 1945. See G. Jones, 'Foreign Multinationals and British Industry Before 1945', *Economic History Review*, 3, (1988).

manufacturers or engineers. Whilst this represented the largest occupational sector, a small but significant number of directors declared themselves car manufacturers (8%) and Gentry (9%). The latter two categories were significant since they almost certainly provided capital for component firms. For example, appendix 1 shows that the wealthy Riley family, whose main business interest was car manufacture, financed three component firms, whilst the financial backers behind firms such as Coventry Chain, Hewer Car Bodies, Forman Motor Co and Thomas Pass all described themselves as 'gentlemen'. The break down of directors' occupations can also reveal the social class of directors. Using the criteria set by David Jeremy in the *Dictionary of Business Biography*, the directors, through the nature of their occupations, were placed into two broad categories.[6] Class I included the gentry, large farmers and landowners, large businessmen, professionals like doctors, solicitors and senior managers or agents. Class II comprised small businessmen, independent craftsmen, retail traders, clerks, and white collar workers. In the case of Coventry's business community, the directors who declared themselves car manufacturers were largely derived from wealthy families such as the Rileys and consequently were placed in class I along with the occupational groups of gentlemen and solicitors. On the other hand, in the course of research, it was discovered that the vast majority of directors who stated that they were component manufacturers or engineers were small businessmen or independent skilled craftsmen. This group was subsequently

[6] D. Jeremy (ed). *Dictionary of Business Biography*, (1984-1986). The project's research methodology is examined in D. Jeremy 'Anatomy of the British Business Elite 1860-1980', *Business History*, 26, (1984).

categorised as class II. Although occupational status can hide a multitude of variables, the exercise does provide a useful guide to the class structure of the Coventry car component industry.

Table 5.2
Class Structure of Directors involved in the Coventry Car Component Industry

CLASS I	***CLASS II***
Gentlemen 9%	Component Manu/Engineer 65%
Solicitor 4%	
Car Manu 8%	
Total 21%	***Total 65%***

Source: Appendix II

Table 5.2 shows that a large majority, 65% of directors who stated their occupation, were derived from class II. The high proportion of directors in the class II category would suggest that many of the firms involved in the Coventry car component industry were either small scale, owner managed or family firms. To test this hypothesis further, an analysis of the founders of firms and the size of firms' boards was undertaken. Clearly firms with one or two directors who founded the concern would indicate that they were owner managed firms, while boards with more than two family members would suggest that they had considerable influence on a firm's affairs.

Table 5.3 analyses the size of boards of 38 firms for the period 1895-1914 and 54 firms for the years 1915-1936. While evidence for the size of firms was sketchy for the period prior to the First World War, the average totals for both sets of years show that the size of firms' boards did not alter dramatically.

Indeed between 1895-1839 the component industry averaged only three board members per firm.

Table 5.3
A Sample of the Size of Firms' Boards in the Coventry Car Component Industry 1895-1939

Number on Board	*1895-1914*	*1915-1939*
1 Director Only	2 (Firms)	11 (Firms)
2 Directors Only	13 (Firms)	13 (Firms)
3 Directors Only	9 (Firms)	12 (Firms)
Over 4 Directors	14 (Firms)	18 (Firms)
Total Number of Firms	38 (Firms)	54 (Firms)
Mean Board Size	**3**	**3**

Source: Appendix II

From a total of 92 firms sampled during the years 1895-1914, 60 possessed only between one and three directors. Thus the sample suggests that the typical board room structure in the car component industry consisted of either a single director operating an owner managed enterprise, two directors acting as partners, or three directors of whom all may have had a stake in the firm or may have been connected with the business through family ties. Moreover, it is imperative to clarify the extent to which owner managers who founded their firm or family firms dominated the component industry since this group of business men and women have taken centre stage in the 'entrepreneurial failure' debate.[7]

Since there was very little difference between owner managed and family concerns, both in behavioural characteristics and the organisation of a firm, they were classified under the 'family

[7] W. Lazonick, 'The Cotton Industry', pp. 44-5.

firm' category.[8] From the 263 directors listed in appendix 1, 100 directors (38%) founded family firms prior to 1914. Moreover, of the 100 people that founded firms before the First World War, 23 (23%) were still on their respective firm's board after 1930. Given that the entry and exit of firms was high during the interwar period, and the possibility that a proportion of pioneering founders would have died by 1930, the number of founders continuing to control their firm was particularly high. Indeed, the fact that over one third of the directors sampled founded their own firm further confirms the hypothesis that the Coventry car component industry was dominated by family firms. Family influence in car component firms began to wane only after the second world war when the motor industry underwent a series of mergers.[9] This trend was reflected in the ownership changes in three of Coventry's most well known family firms. Thus by 1960 the Jackson family had been replaced at Coventry Radiator, the Brett family were no longer on the board of Brett's Stamping, and, for the first time in almost two hundred years, the Rotherham family had lost control of Rotherham and Sons.[10] Moreover, some firms which persisted with a family dominated management structure after the war increasingly ran into difficulties when their old-established contacts were replaced and when during the late 1950s and early 1960s Coventry's importance in the motor

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[8] For the problem of defining the 'family firm' see R. Church, 'Family Firms and Managerial Capitalism: The Case of the International Motor Industry', *Business History*, 28, (1986). R. Church, 'The Family Firm in Industrial Capitalism: International Perspectives on Hypotheses and History', *Business History*, 35, (1993), pp. 17-43.

[9] G. Maxcy, 'The Motor Industry' in P.L. Cook and R.L. Cohen (eds), *Effects of Mergers*, (1958), 351-393.

[10] *The Times*, 4 April 1957, p. 19.

industry sector started to recede.[11] One such business which suffered in this way was the Coventry Movement Company.

Although Coventry Movement Company was established as a quasi-co-operative in 1889, by a group of watch manufacturers, the firm's business strategy was largely dictated by family considerations. The board of directors, such as Drinkwater, Shufflebotham and Pierson who had been connected with the firm since the late nineteenth century, had largely remained unchanged by the 1930s and 1940s. Indeed, during this period it was noted that the firm needed to elect additional directors as they were 'all advanced in age'.[12] Both T. Bolton, son of the chief engineer and C.H. Yeoman, the nephew of the chairman were elected. As late as the 1960s, the majority of directors, such as Pierson, Bolton and Yeoman, were direct descendants from the founders of the firm. However, by the 1960s, the strong family influences which ran through the firm were actually cited as a major weakness in the structure of the company.[13]

Another indication of whether the Coventry car component industry was derived from small family firms was the location of a firm's head office between 1896-1939. A firm's head office located outside of Coventry would suggest that the firm was a subsidiary of a larger organisation.

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[11] A. Mallier and M. Rosser, 'Industrial Decline in Perspective: The Car Industry in Coventry', Staff Seminar Paper, Dept of Economics, Coventry University, (1982).

[12] Coventry Record Office (hereafter CRO), ACC 1246/1/1, Coventry Movement Minute Book 1932-1964, 30 September 1944.

[13] CRO, Acc 1246/4/1, Report by Fisher and Co Management Accountants and Consultants, March 1966.

Table 5.4
The Number of Coventry Component Firms and the location of their Head Offices

Date	1912	1919	1936
No of Firms	61	78	62
Cov HO	57 (94%)	75 (96%)	52 (84%)
External HO	4 (6%)	3 (4%)	10 (16%)

Sources: See Appendix II

Table 5.4 shows that between 1912-1936, the vast majority of Coventry car component firms based their head offices in the city. Thus although the number of firms with head offices based in Coventry declined slightly by 1936, externally located head offices only accounted for only 10 per cent of the firms in the industry.

Consequently, these findings raise certain questions concerning the component industry between 1895-1939. Did the high proportion of family firms block the financial expansion of concerns due to a reluctance to enter into mergers or public floatation through a fear of losing control? Moreover, did the high number of family members on boards at the expense of technical and commercial staff put family firms at a disadvantage to professionally managed firms?

The Family Firm and the Question of Growth

A key characteristic attributed to family firms is an unwillingness on the part of the owner-manager or founder to lose overall control of a firm through merger or public floatation. Thus mergers or take-overs of family firms usually occurred only if a concern ran into problems such as financial difficulties, ageing owners with no next of kin, or disputes between partners. Consequently, in terms of increased

productivity and financial expansion, family firms have been perceived as possessing conservative instincts.[14] Certainly, on initial inspection, the pattern of mergers and take-overs in the Coventry car component industry between 1895-1939 seem to conform to this interpretation. For example, the motivation behind the take-over of the body builders Hawkins and Peake by Rover stemmed from an inability of the two ageing owners to cope with the increase in trade. In 1906, the Lloyds Bank manager reported that the reason for the sale was 'that the business has so increased they cannot stand working from 8am until to 8pm and want to take it easy'.[15] Similarly, in 1936, E.J. Hardy, who had founded his firm Hardy and Company in 1903, approached the Renold and Coventry Chain Company with the view of a merger. Charles Renold, Renold's managing director, reported to the board that:

> The idea first arose in the course of an accidental meeting between Mr E.J. Hardy and Mr Ace [R&CC], and the ostensible reason put forward by Mr Hardy for giving the matter consideration was the fear of what might happen to his company in the event of his decease (death duties etc.), he being the owner of something like one half of the capital. He had apparently considered floating the company but felt there were certain objections to this.[16]

Although E.J. Hardy was unsuccessful with his first merger bid in 1936, the founder eventually achieved his aim by merging with GKN some years later.[17]

The reluctance of families to relinquish control of firms was

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[14] R. Church, 'The Family Firm in Industrial Capitalism', pp. 17-43.
[15] Lloyds Bank Archive (hereafter LBA), B379a/15, 28 June 1906.
[16] Manchester Central Library Archive Section (hereafter MCL), M501/650.021/R&CC 936/6, Renold and Coventry Chain Archive, Proposal from Hardy-Spicer for a merger with R&CC, 8 December 1936.
[17] M. Adeney, *The Motor Makers. The Turbulent History of Britain's Car Industry*, (1988), pp148-149.

illustrated by Alfred and John White who possessed a controlling interest in White and Poppe, one of the motor industry's most important engine makers between 1900-1919. Throughout this period the concern was often unable to cope with the large increases in demand since it preferred to extend bank loans instead of inviting new capital. For example, in 1909 White and Poppe rejected an offer from the Deasy Motor Company to increase the firm's capital to £10,000 as the deal required the White family to relinquish aspects of production policy to the car assembler.[18] In fact, it was a dispute between Peter Poppe and Alfred White over production policy which resulted in a take-over of White and Poppe by Dennis Brothers in 1919. Without Poppe's design skills, White had little option but to take up Dennis' offer and effectively retire from the car component industry.[19] Another dispute between partners also resulted in a founder retiring from the industry after a subsequent take-over. Two former Daimler engineers, W.S. Tyler and C.E. Hatfield, established Coventry Motor Fittings in 1902. However, in 1915 Tyler, who already owned three quarters of the concern's shares, purchased Hatfield's shares after a disagreement over war time production strategy. However, by 1917 Tyler found it increasingly difficult to manage the firm on his own and consequently sold the whole of the business to Louis Garrett a local manufacturer.[20]

However, the most recurrent reason for families to relinquish control of the firms they established was financial difficulties.

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[18] LBA, B379a/18, 6 December 1909.
[19] D. Thoms and T. Donnelly, *The Motor Car Industry in Coventry Since the 1890s*, (1985), p.86.
[20] Anon, *Motors and Motoring*, (1908), p. 85. MBA 358/9 18 January 1915, 9 October 1919.

For example, the small component firm Doherty Motor Accessories experienced financial problems from its very foundation in 1902. Founded with a capital of only £200, the company was unable to purchase enough labour and materials to keep up with the demand. In the same year Lloyds Bank manager observed that the two owners, Page and Doherty:

> Called and wished to make arrangements for an overdraft of £100 to £150 as their business was increasing so fast they now have an order in for £4/5,000. It appears one gentleman offered to put £500 in the business, and another £800, but they want to keep it in their own hands...

With such a small capital the bank would only sanction occasional overdrafts of between £10-12 to cover wage bills and advised Page and Doherty that 'if they could not otherwise find sufficient capital perhaps it would be as well to accept the gentlemens' offer'.[21] Within two years, after a run of bad debts totalling £250, Page and Doherty were bought out by J. Marriot, a partner in Phillips and Marriot, a Birmingham engineering company.[22]

Similarly, the founders of two of Coventry's most important electrical firms were both taken over after incurring financial problems immediately after the First World War. ML Magneto had been established by D.K. Morris and G.A. Lister in 1908, to manufacture magnetos and small electrical components. Despite increasing the capital to £15,000 in 1915, competition within the electrical sector of the component industry was intense, and consequently ML Magneto was the subject of a successful take-over bid by Smith and Sons of Cricklewood in 1919.[23] In the

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[21] LBA B379a/12, 9 November 1902.
[22] LBA B379a/13, 18 April 1904, 20 July 1904.
[23] CRO, Acc 1107/1 ML Magneto Minute Book 1915-1930, 20 August

same year, the founder Hermanus Van Raden left the firm he founded after Van Raden and Company was purchased by Robert Rankin and John Percy Starley, two businessmen in the battery trade from the south east. However, Van Raden's departure from the firm was not of his own making, but a decision made by the wealthy Robinson family who had financed the firm since 1903.[24] This relationship did not run smoothly since Carey Burt Robinson, a Warwickshire gentleman and the firm's major shareholder, was not convinced that Hermanus Van Raden possessed the capability to run a business effectively. During an interview with his bank manager, Carey Robinson expressed grave doubts about his son's (Vaughan Robinson) continued enthusiasm for Van Raden and the firm. In 1907, the Lloyds Bank manger reported that:

> Mr C. Robinson...told me privately that the company had not got a magneto...they have only accumulators which are out of date, [he is] expecting very small things. He thinks Vaughan Robinson will lose a lot of the family's money in this concern, as there is not sufficient management, and asked me if I could warn him about this in a fatherly way.[25]

Prior to the First World War, repeated attempts by Lloyds Bank manager to persuade Vaughan Robinson to sell the family shares consistently failed. After the war though, the family had little option but to accept their bank manager's advice after the firm was left with large stocks of unwanted military car components which resulted in a severe financial loss to the Robinson family. Indeed, Eric Starley recalled how his father, when purchasing the company in 1919, discovered 'thousands of old electric car

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1919. Public Records Office (hereafter PRO), BT 31 22688/139152, ML Magneto Share allocation and capital 1915-1930.

[24] LBA, B379a/13, 5 June 1903.

[25] LBA B379a/16, November 12 1907.

bulbs there and they smashed all these and took out the Tungsten contact and sold those...they were all obsolete stuff'.[26]

The founders' desire to remain in control of the company, must then, be interpreted as an important reason for the high proportion of founders remaining on company boards between 1895-1939. However, it is too simplistic to argue that continued family control was a key factor restricting the growth and expansion of firms in the component industry. After all, family firms did not inherently oppose the growth of their firm, and in many cases accepted the merger or floatation of their firm if a degree of autonomy was safeguarded.[27] Moreover, the relatively small numbers of mergers and take-overs in the Coventry component industry between 1895-1914, cannot be simply attributed to the continuation of family control, but to the highly competitive nature of the industry itself. With the large influx of small component firms, especially after the First World War, car assemblers expressed little desire to takeover a supplier when there were many component firms undercutting one another.[28] Moreover, many of these small firms lacked the resources to merge with other component firms or to issue shares to the public. In other words, the economic structure of the Coventry car component industry gave firms little opportunity to merge or expand. Where a firm began to experience substantial profits, family founders were often willing to forgo a proportion of autonomy for greater capital and

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[26] Interview with Mr Eric Starley, former managing director of Radentie Batteries, 2 October 1992.
[27] R. Church, *The Rise and Decline of the British Motor Industry*, (1994), pp. 26-32.
[28] See Chapter 3 on the Exit and Entry of Firms in the component industry.

profits.[29]

Thus, family ownership of a firm which began to experience success in a particular branch of the component industry was not a bar to further expansion through financial investment by external parties or public issue. However, historians have continued to seize on the personal characteristics attributed to the small businessmen to demonstrate a direct causal link between family firms and a conservative approach to company expansion.[30] Certainly, there can be little doubt that the people in control of owner managed or family firms shared a common identity that was grounded in a elementary education supplemented with an engineering apprenticeship. Moreover, there is some evidence to suggest that this instilled a conservative instinct in its recipients.[31] For example, an analysis of three family firms Van Raden, Pistons Ltd and Hardy and Company demonstrate that the owners all showed a common adherence to conservative attitudes. On the subject of company expansion, Eric Starley, a former Managing Director of Radentie Batteries (formerly Van Raden), recalled that 'my father never wanted to be a sort of Lucas or anything in expanding the business...he was content for the output to reach a few hundred'.[32] Similarly, Gordon Parsons, a former Managing Director of Pistons Ltd, remembered that his father 'did not want the bother' of attempting to increase the firm's capital by

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[29] See Chapter 4 on the sources of finance of Component Firms.
[30] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, (1962), p. 41. B. Elbaum and W. Lazonick, 'An Institutional Perspective on British Decline', in B. Elbaum and W. Lazonick (eds), (Cambridge 1986), p. 5.
[31] A.E. Harrison, 'The Competitiveness of the British Cycle Industry, 1890-1914', *Economic History Review*, 22, (1969), p. 302.
[32] Interview with Mr Eric Starley, 2 October 1992.

attracting external financial support.[33] Both firms remained small family concerns with little or no capital expansion between 1914-1939. Moreover, Edward J. Hardy, who had began manufacturing car components in a small way in 1903, was on the verge of selling his business six years later. The Lloyds Bank manager noted that Hardy, who was the son of a small Birmingham jeweller, was 'not ambitious, and does not want to live beyond the position that he was brought up'.[34] However, after Hardy experienced a rapid increase in sales and royalties in 1914 when he patented the first reliable universal joint, he seemed to have had a change of heart.[35] Hardy relinquished fifty per cent of control in the firm after entering into partnership with an anonymous financial backer. Through the aid of external finance the firm swiftly expanded and by 1939, it was producing over 3,000 universal joints a week and was employing over one thousand people.[36]

Yet, all three car component pioneers had emerged from the Edwardian era with similar social backgrounds and financial resources. The difference then, does not so much lie in the social and economic background of entrepreneurs, but more the particular branch of the component industry the firm was situated in. Thus, Van Raden had little realistic opportunity to challenge the dominance of Lucas and consequently restricted production to small runs of 'quality' batteries. Likewise, Pistons Ltd had found a niche in a pistons market dominated by the Leeds firm Specialoid, in supplying small batches of pistons

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[33] Interview with Mr Gordon Parsons, former Managing Director of Pistons Ltd, 16 October 1992.
[34] LBA, B379a/18, 22 March 1909.
[35] LBA, B375a/21, 6 October 1915.
[36] Adeney, *The Motor Makers*, pp148-149.

to quality car makers. In the case of Hardy, the favourable market conditions and investment offers (which Radenite and Pistons did not receive), were to over-ride his conservative and 'unambitious' instincts. Thus, a firm which had entered a less dominated sector of the component industry was always more likely to be approached by external financiers. Moreover as long as an element of family autonomy was safeguarded, family firms positively encouraged expansion.

The favourable market conditions and the assurances over continued family control were certainly present prior to the public floatation of Cornercroft Ltd in 1936. Cornercroft had been established in 1920, by two practical engineers Norman Rycroft and John Corner.[37] Despite the a small capital, which was only £2,589 in 1928, the concern was the first component firm to patent and manufacture the car wheel disc.[38] Whilst the firm enjoyed modest profits that averaged approximately £4,500 a year between 1927-1935, it was not until after public floatation that the company recorded profits of over £22,000 a year in 1937.[39] However, although Rycroft and Corner and relinquished their shares in the company, they remained on the board and retained their control over production matters. The continuation of Rycroft and Corner in management positions was mainly due to the fact that the major share holder was W.F. Strickland, a 'commercial man' and conservative MP for Coventry.[40]

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[37] The term 'practical engineer' will be taken as someone who has served an engineering apprenticeship.
[38] *Autocar*, September 21 1934, p. 527.
[39] CRO, Acc 1468/1/1 Cornercroft Monthly Balance Sheet August 1927-1937.
[40] CRO, Acc 1468/1/2 Cornercroft Minute Book 1936-1939, 22 June 1936.

The vexed question of continued family control after public floatation was a central issue in the growth of Coventry Chain between 1907-1930. Although the Coventry Chain Company, which was founded by Alick Hill in 1896, had developed reasonably well, the firm did not experience any material progress until 1906 when profits were estimated at between £3,000-£6,000.[41] It was this at this juncture that the Hill family, who were the sole shareholders of the company, were approached by Daimler who persuaded the family to issue shares to the public in 1907.[42] Whilst Daimler invested a substantial figure, the public floatation of Coventry Chain resulted in the board being divided into two main interests groups, the Hill family based in Coventry and the 'London interests' represented by Charles Goff, a businessman who had financial interests in a number of major companies.[43] The original agreement between these two parties decreed that since the London based executives were mainly 'commercial men', the Hill family would preside over the management and day to day running of the company. Indeed, Alick Hill would almost certainly have rejected any deal which would have reduced his leading role in the management of the firm. Thus despite existing as a public company, the firm had three members of the Hill family in key positions on the firm. However, in practice such an agreement was difficult to keep and, consequently, the firm's board meetings were often stormy affairs. Even in Coventry Chain's official history, Basil Tripp noted that:

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[41] Midland Bank Archive (hereafter MBA) 358/5, 18 April 1907.
[42] Ibid.
[43] For biographical information on Charles Goff see MCL, M501/061.5/R&CC 932/2, 'The Goff Affair'.

Coventry business community. The manager of the Midland Brick and Lime Works in Coventry wrote to a colleague insisting that the output of bricks should be increased to at least eighty-thousand a week to cope with prospective orders from companies associated with autocar manufacture. He predicted that over '10,000 more people will be working in Coventry in the course of a year [and] they cannot get houses to live in, it is far worse than when the boom was on before...'[8] With the establishment of the British Motor Syndicate and the success of the cycle industry in 1896, business men entered the car manufacturing industry with great optimism. The *Coventry Graphic* described 1896 as the 'signal for the starting of feverish activities in the motor business. There was no time to wait for works to be built. Everyone was anxious to "start constructing"'.[9]

However, as we have seen, a clearly identifiable car component sector did not establish itself in Coventry until some years later. The lack of a supply sector was recognised as a problem by contemporaries such as Frederick Lanchester, one of the pioneering engineers of the late nineteenth century motor industry. Recalling his early experience of the motor trade, Lanchester noted that:

> the difficulties of management were very great partly owing to the fact that no ancillary trades had been developed, and we had to do everything ourselves, chassis, magneto, wheels, body work, etc., everything except the tyres.[10]

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[8] Coventry Record Office (hereafter CRO), Acc 279/44/6253 Letter from Midland Brick and Lime Works, 1896.
[9] *Coventry Graphic*, 28 November 1913, p. 3
[10] Littlewood, 'The Location of the British Car Industry 1888-1940', 14.

London group of directors and the Brampton family. The Hill family clearly lost the authority that Alick Hill had carried within the business, and illustrates the importance that was generally attached to founding directors. However, the second phase in Coventry Chain's development also demonstrates how family concerns could continue to dominate a firm, despite merger and public issue, if the family manoeuvred themselves in the higher echelons of company management.

Coventry Chain's merger with Renold Chain in 1930, enabled the Renold family, through careful planning and alliances, effectively to remain in control of the new public company. Until 1930, Renold Chain had been a private company, established in Manchester in 1879 by Hans Renold who still remained on the board. Prior to the merger, Charles Renold, the son of Hans and the company's Managing Director, identified family control as the main priority.[48] In 1927, a confidential memorandum by Charles Renold outlined some of the disadvantages that a merger with Coventry Chain could bring:

> At present we have our fate in our own hands as far as voting power is concerned. We would forfeit this in an amalgamation due to the personal situation, however, there seems no doubt that the Hans Renold Ltd men can entirely dominate the Board of an amalgamation, and it is believed that the Hans Renold Ltd share holders in combination with those of the Brampton family would command a majority of share votes.

Indeed, Charles Renold's proposed board ensured that he placed himself as Managing Director, Hans Renold as Chairman, while

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[48] Analysis of the merger between Coventry Chain and Renold Chain in terms of rationalization, standardization and the financial status of the two firms prior to amalgamation is analysed in chapter 6. This section will examine the merger's effect on the firms' board room composition and managerial structure.

Arthur Brampton occupied the Vice Chairman's position. The three Coventry Chain directors, Fell Clark and Norman and Arnold Hill were 'unprovided for'. However, although they did not possess a managerial function, Renold noted that their inclusion on the board 'might be desirable for appearances'. Moreover, Charles Renold's detailed plan envisaged that the important managerial decisions would take place in Manchester, while Coventry would only be given 'simplistic' management judgements to make. Renold was also concerned that the Coventry management would resist the imposition of the 'Renold philosophy'. Charles Renold's solution was to replace the entire top tier of Coventry management with 'Renold men'. In 1927, he wrote that there was a:

> difficulty of absorbing organisations and staffs with different outlooks and traditions to ours, and of infusing "Renold" outlook on them. We have several men coming on and capable of wider scope. We can in fact put Hans Renold men in all the key positions.[49]

Nevertheless Renold's effective take-over of Coventry Chain did not run smoothly. The discontent on behalf of the former Coventry Chain directors spilled over into the open during the second AGM of Renold and Coventry Chain Ltd in 1932. Charles Goff, a former director of Coventry Chain, claimed that he and others at the Coventry firm had been subjected to a witch hunt by Hans and Charles Renold, who would not rest until they obtained their resignations. Indeed, Goff recalled that during the merger negotiations, the Coventry Chain directors had insisted that any new board would include a member of the Hill

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[49] MCL, M501/650.021/ HR 927/4, 'Special Financial Investigation 1927-1928' by Charles Renold, 30 July 1927.

family in a high managerial capacity:

> When this company was formed [1930] the Managing Director [Charles Renold] promised Mr Kendrick [Coventry Chain Chairman] and myself that he would do his utmost to fit Mr Arnold Hill to occupy a high managerial position in the company. He nobly fulfilled this promise by dispensing with the services of Mr Arnold Hill 18 months after the formation of the company.

Goff also maintained that he had 'incurred the blind, vindictive hatred of the Chairman and Managing Director, and they, with certain others, were determined to encompass my removal from the Board'.[50] However, with the alliance between the Brampton and Renold families, Charles Renold was successful in implementing his aim of concentrating power in Manchester and the Renold family.

The first section of this chapter has argued that although family firms dominated the industry, it is misleading to presuppose that family firms necessarily restricted the expansion or merger of firms. Moreover, the section has questioned the assumption that, due to their social and economic background, small founders inherently lacked entrepreneurial ambition. The question of whether family firms were willing to welcome fresh capital into the firm rested on two central factors. First, that branches of the car component industry afforded the market opportunities for a firm's expansion, and second, that a degree of autonomy remained in the hands of the family. Thus, in other words, the process of whether firms expanded relied less on the conservative characteristics attributed to family firms, but was instead focused on the

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[50] MCL, M501/650.021/ HR 930/1, 'The Renold and Coventry Chain Co Ltd Verbatim Report of the Annual Meeting of Shareholders', 17 November 1932.

question of power and control within the firm.[51] The second section of this chapter will investigate the other realm of owner responsibility - the appointment of managers. Did Coventry car component firms possess professionally appointed works managers and, if so, were they derived from a particular type of firm? Second, were the firms who did not appoint professional managers at a technical and commercial disadvantage?

The Appointment of Managerial Staff and the Role of the Coventry Business Community

In an industry dominated by the family firm, it is perhaps not surprising to discover that few firms employed professional managers at board room level. From the list of directors in appendix 1, only 8.5 per cent stated their profession as 'manager' in the articles of association and share allocation forms. Moreover, a closer investigation of these directors reveal that they were derived from three categories of firm, the multinational firm, the foreign firm and the firm which had been subject to a take-over or merger. Thus the pool of professional mangers in the Coventry component industry was mainly derived from multinationals such as BTH and Dunlop and the foreign firms like Hotchkiss et Cie and the Torrington Company. Finally, professional managers were installed in some, including Doherty Motor Accessories and Motor Panels after successful take-overs. However, did the concerns which fell into these categories possess a more effective management structure?

Within the context of the British firm, a merger or take-over,

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[51] For an interesting critique of Chandler's analysis of firms' growth and the question of power and control within a firm see D. Boff and E. Herman, 'Alfred Chandler's new Business History', *Politics and Society*, (1980), 10, pp. 87-110.

was the most common way in which professional managers were installed into car component firms. The dangers for new owners failing to introduce professional managers were evident in the development of Doherty Motor Accessories' managerial structure between 1905-1919. In 1905, Mr Marriot, who was a partner in the Birmingham company Phillips and Marriot, purchased the firm which had formerly been owned by Doherty, an engineer and Page, a clerk. Consequently, the management structure continued to be dominated by the Page and Doherty families. However, without a financial interest in the concern, the families appeared to lose enthusiasm for the business. The manager of Lloyds bank noted that during 1905 the firm's turnover and working costs should have resulted in a clear profit of over £1,500, instead of the £300 loss. In his daily journal he wrote that Mr Marriot 'thinks they have been robbed...Mr Page is no good and as works manager instead of getting there at 6.30am, he gets there often at 9.30 am...the secretary Cooper, is Page's brother in law and there is something evidently wrong...'[52] The problem was exacerbated by Marriot death in 1913 for while the firm's shares remained in his family they showed little interest in improving its management. The day to day business of the firm was left to Mr Fenton who, it appears, was less than competent as works manager. In a stormy meeting with the manager of Lloyds Bank, Fenton had claimed that the firm's balance sheet was wrong and that in fact they were £1,000 in profit. The bank manager responded by informing him that:

> I had no confidence in the business, nor him, as he promised...to always to be at the works by 9 o'clock. He

[52] LBA B379a/14 20 October 1905.

> admits it is usually 11.00, but he is on the phone at 9.00. I said that was no good. He thought I might remember that the loan of £2,700 to Mr Marriot was never intended to be a loan but a gift. I replied that I distinctly remembered that it was a loan.[53]

The managerial staff at Doherty Motor Accessories was eventually dismissed after the Marriot family sold their shares to an external buyer who renamed the firm Osberton Radiators Ltd in 1915.[54]

No such mistakes were made by Mulliners, a Birmingham based body manufacturer, when they took over Coventry Motor Panels in 1937. All aspects of Motor Panels' company business had previously been managed by A.S. Smith, a major share holder in the firm and a 'practical engineer'.[55] This arrangement, however, was not acceptable to Mulliners who informed Motor Panels that:

> the Mulliners Board were not satisfied with the conduct of the business of Motor Panels (Coventry) Ltd, and it was strongly felt that Mr Smith's abilities could be better engaged in closely applying himself to the works side of the business leaving the office and costing developments to the care of and under the control of Mr Rogers and Mr Hart, one of whom would attend each morning in Coventry for that purpose.

Although Smith would still receive £1,000, he was demoted from Managing Director to Stocks Director and his position was reviewed on a yearly basis. Thus, almost immediately after taking over the firm, Mulliners sought to ensure close control of the firm placing Mulliner managers in key positions on the board.[56]

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[53] LBA, B379a/20, 19 March 1913.
[54] R.J. Overy, *William Morris. Viscount Nuffield*, (1976), p. 19.
[55] For List of directors of Coventry Motor Panels see CRO, *Directory of Coventry Manufacturers 1936-1937*, Cheltenham, (1937).
[56] University of Warwick, Modern Record Centre (hereafter MRC), MSS 226/ST/M/1/1/2, Mulliners (Holdings) Minute Book 1930-1939, 29

Another area of British business which saw the introduction of the professional manager was in the multinational or foreign firm. Chandler has argued that British industry, particularly in the electrical engineering and chemical sectors, lacked the integrated enterprises administered by American style managerial hierarchies.[57] Moreover, contemporaries perceived that American companies often transferred their efficient management techniques though placing American staff in their British subsidiaries. In 1945, the *News Chronicle* reviewed the apparent differences between British and American firms. The city editor stated that the names of 'Ford, Vauxhall, Singer, Kodak, Hoover, Standard Telephone, are bywords for efficiency [and] good management' and later contrasted them with 'inefficient British industries'.[58] Certainly there is evidence that American managers were placed in some Coventry car component firms. For example, in 1928, the American owned Torrington Company employed four Americans and one British person to perform the dual role of directing and managing the company.[59] Moreover, these managers had very little influence in the running of the firm since the real decision making was concentrated in Torrington's parent company in Connecticut USA.[60]

However, these instances of American firms imposing their managerial structures and expertise on British firms were to

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December 1938.

[57] A. Chandler, 'Emergence of Managerial Capitalism', *Business History Review*, 58, (1984), pp.496-7.

[58] Quoted in, Jones, 'Foreign Multinationals and British Industry', p. 440

[59] PRO, BT31 30520/240712, Torrington Co Ltd, Articles of Association and Share Allocation Lists 1929.

[60] Author's private collection, Letter from G.R. Willaimson Company Secretary of Torrington Company Ltd detailing the firm's history, 6 March 1992.

prove the exception rather than the rule.[61] Indeed, once the BTH organisation, Coventry's largest electrical component manufacturer, is analysed closely, it is clear that the internal organisation did not differ greatly from that of its British competitor. BTH, which by 1930 was part of the American AEI group, closely resembled the typical British managerial structure of a loose confederation of subsidiaries with weak central control.[62] Moreover, each subsidiary within the BTH group also exercised a high degree of managerial autonomy. After the First World War when production reached an all time low due to the termination of military contracts, A.P. Young, a BTH engineer, recalled that 'there was a strong feeling abroad to shut the factory down', but the view was not shared by the Coventry management who 'had a greater vision'.[63] Consequently, BTH in Coventry was allowed to continue to stay in business since power was diffused throughout the organisation and not concentrated in one body that characterised in the classic American management model. Indeed, the appointment of George Ralph, as Coventry's managing Director in place of C.R. D'Arcy, was not so much a directive from above but from below. A.P Young, who had been among the first pioneers to develop a reliable magneto, had been unhappy with the production strategy which the Coventry management had adopted during the First World War. Young later recalled that the Coventry management's decision not fully to embrace the manufacture of

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[61] For example in the 1930s, Ford UK replaced its American executives with British managers which included Sir Percival Perry. See Church *The Rise and Decline of the British Motor Industry*, p. 71.
[62] Jones, 'Foreign Multinationals and British Industry', p. 440.
[63] MRC, MSS 242/BIO/8, AP Young Collection, unpublished autobiography, 'An Industry is Born', p. 42.

the magneto raised questions in his mind on their ability to manage the firm:

> I had to face a grievous personal problem for I had never been happy with the top management in Coventry. Now I knew with certainty that this management was incapable of directing the Coventry organisation in the manner needed to meet the challenge of creating a new high tension magneto industry.[64]

The senior management in Rugby, fearing that Young would resign if he was not afforded with more influence in the company, dismissed D'Arcy and his assistants and appointed George Ralph as Managing Director, and Young as his assistant.

The second reason put forward by historians for the superiority of foreign firms, was the influence of American trained managers. However, together with other American firms in the British Motor Industry such as Firestone, General Motors and Ford, BTH employed few American managers, preferring to appoint British staff in senior management positions.[65] Whilst, H.N.S. Sporsburg, the Chairman of BTH in Britain was American, most of the directorate in Rugby and the whole of the Coventry board were derived from British personnel. Moreover, the British staff that were appointed in American firms were generally not qualified in management but had qualifications and experience in engineering. For example, when Coventry's BTH factory was established in 1912, the entire directorate, C.R. D'Arcy, R. Rogers and F.V. Pipe, were all previously meter engineers from the Rugby plant.[66] The policy of appointing engineers as opposed to professional managers, a distinctly

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[64] Ibid, p. 5.
[65] Jones, 'Foreign Multinationals and British Industry', p. 441.
[66] H.A. Price-Hughs, *BTH Reminiscences. Sixty Years of Progress*, p. 16,31

British tradition, was to continue within Coventry's BTH plant throughout the interwar period.

Why, then, did Coventry's largest American car component firm adopt a managerial structure that had more in common with British firms than its American counterparts? The answer may lie in the fact that the characteristics usually attributed to the family firm enabled firms successfully to compete in the Coventry car component industry. One key factor which was often characteristic of family firms was the lack of professional training of managers in both technical and commercial spheres. For example, the appointment of several top managers in the motor industry were directly due to family connections. Major Sydney Dick, John Black and Spencer Wilks all began their careers in the motor industry after marrying three of William Hillman's daughters and subsequently attaining top management positions at the Hillman owned firm Automachinery. John Black and Spencer Wilks later left the firm to take up managing directorships at Standard and Rover respectively.[67] This move, was in turn to create an opportunity for Dick's nephew Alick Dick, who joined Standard in 1933.[68] Thus family appointees usually did not possess any formal management or technical education. Indeed, this was the case, particularly, for the founder of a concern who merely possessed an experience of practical engineering and a knowledge of the branch of the component the industry he was entering. Certainly, during the formative years of the industry, formal training in engineering

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[67] Jeremy, 'William Hillman', *Dictionary of Business Biography*, (1985), pp. 245-247.

[68] Coventry University, Lanchester Oral History Archive (hereafter LOA), Interview with Alick Dick, (n.d.). Jeremy, 'Alick Sydney Dick', *Dictionary of Business Biography*. (1984), pp. 100-102.

and management was limited. However, two major firms in Coventry, Daimler and Coventry Ordnance Works, provided invaluable practical engineering experience for prospective founders. The two firms provided a contrast in the training of engineers as Daimler's reputation had been built on the high quality of its products whilst COW had become associated with new manufacturing techniques and volume production. Daimler's and COW's role in practical engineering was later enhanced during the interwar period when they sent engineers on day release to Coventry Technical College.[69] During the Edwardian period, however, informal experience in the motor industry was certainly a prime consideration for local bank managers when they assessed the prospects of a firm. Moreover, alongside engineering experience, Daimler also offered prospective entrepreneurs with an insight into the supply side of the motor industry, a sector which had not developed rapidly during this period.[70] Such was the scale of the Daimler organisation that engineers left the firm to establish businesses in a variety of branches in the component industry. Thus the Lloyds bank manager noted that Doherty and Page, who established Doherty Motor Accessories, were both 'practical men' who had previously worked in the Daimler supply department.[71] Likewise, W.A. Tyler and C.E. Hatfield, prior to establishing Coventry Motor Fittings in 1902, both worked at

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[69] D. Thoms, 'Technical Education and the Transformation of Coventry's Industrial Economy, 1900-1939', in P. Summerfield and E.J. Evans (eds), *Technical Education and the State Since 1850. Historical and Contemporary Perspectives*, (1990), p. 40.
[70] B. Beaven, 'The Growth and Significance of the Coventry Car Component Industry 1895-1914', *Midland History*, 18, (1993).
[71] LBA, B379a/11, 9 November 1902.

Daimler's bonnet and radiator departments.[72] Bobby Jones, also resigned from Daimler after working for some time as a body builder to establish Robert Jones Ltd, which later changed its name to Carbodies in 1928.[73] Finally, Daimler's electrical department gave F.W. Highfield the experience to establish Highfield Electrical Company after the First World War.[74]

Whilst Daimler trained engineers in a variety of skills, COW was at the forefront of new technology and production techniques. One recipient of this training was C.R.F. Engelbach who, after leaving COW in 1921, became works manager at Austin Motors and introduced a series of production line methods.[75] Other significant engineers who gained practical experience at COW included William Bullock who left to manage Singer Motors,[76] and his brother, Frank Bullock who established Pistons Ltd in 1911 and later Valves Ltd in 1916. Indeed, prior to establishing Pistons, Bullock's founding partner, Harry Parsons had also trained at COW as a practical engineer.[77]

Along with Daimler, and COW, a number of Coventry's relatively new engineering industries provided practical experience for entrepreneurs. For example, after leaving London to become a practical engineer at Coventry's Premier Cycle, William A. Oubridge established the British Chuck and Tool Company (later the British Piston Company) in 1909 and

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[72] Anon, *Motors and Motoring*, p. 85.
[73] K. Richardson, *Twentieth Century Coventry*, (Suffolk, 1972), p. 57.
[74] *City of Coventry Official Handbook 1933*, (Cheltenham, 1933).
[75] Jeremey, *Dictionary of Business Biography*, 2, (1984), C.R.F. Engelbach, p. 288.
[76] Jeremey, *Dictionary of Business Biography*, 1, (1984), W.E. Bullock, p. 496.
[77] Interview with Mr Gordon Parsons, former Managing Director of Pistons Ltd, 16 October 1992.

Holbrook Bodies in 1920.[78] Another new concern, the Forman Motor Company, produced three 'practical engineers' who left the firm to establish Johnson Hurley and Martin in 1903 after being disillusioned with Forman's management of the company.[79] Butlin Ltd, was also established in a similar manner, when, in 1933, Butlin rightly perceived that Charlesworth Bodies was facing bankruptcy. Subsequently, Butlin left the firm to establish his own business using the contacts he had made at Charlesworth to gain a foothold in the market.[80]

Therefore, as A.E. Harrison discovered in his research on the cycle industry, the deliberate employment of formally educated managerial staff in the component trade was the exception rather than the rule.[81] Moreover, whilst formal technical training was often lacking, managers with commercial training in sales and marketing were also few and far between. However, in a supply industry such as the car component industry, it was imperative to possess an effective communication structure with other suppliers and, above all, car assemblers. Consequently, firms followed a tradition, that began in the cycle industry, of appointing key individuals who possessed a good insight into the trade and an intimate knowledge of important firms within the area. The significance of this strategy was revealed by analysing the number of directors who held more than one directorship in the sample represented in Appendix 1. The sample of 263 directors taken from 70 component firms between

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[78] Harrison, 'The Competitiveness of the British Cycle Industry, p. 302. *Coventry Standard*, Industry in Coventry Supplement, 8 November 1963. CRO, Acc 606, Daffern and Stephenson Collection, Holbrook Bodies Balance Sheets 1927-1929.

[79] LBA, B379a/12, 15 April 1903.

[80] MBA, 358/13, 7 December 1933.

[81] Harrison, 'Competitiveness in the British Cycle Industry', p. 302.

1895-1914, showed that twenty-one individuals (8%) held more than one directorship. However, of these twenty-one directors, seven (33%) held over two directorships. Table 5.5 shows the most sought after directors that emerged from the sample and the firms that appointed them as paid advisors.

Table 5.5
A Sample of Key Directors with more than two Directorships in the Coventry Car Component Industry between 1895-1939

Name	*Class*	*Dir*	*Occupation*	*Firms*
Baker H.J.	1	3	Co Director	Daimler Motor Co (1899) Mills & Fulford (1903) Brett's Stamping (1836)
Bednell A.	2	4	Agent	TG John (1919) Zephyr Carburettors (1919) Bluemel Bros (1929) Chey'more Sheet Metal (1936)
Hill A.S.	1	3	Manu	Coventry Chain (1896-1921) Bluemel Bros (1913-1921) Smith's Stamping (1917-1921)
Hill C.	1	3	Gentleman	Coventry Chain (1895) Brett's Stamping (1899) Charlesworth Bodies (1907)
Lindley W.N.	1	3	Co Director	Coventry Climax (1904) Coventry Chain (1907) British Piston Ring (1911-45)
Oubridge W.A.	2	3	Solicitor	British Piston Ring (1911-42) Valves Ltd (1916) Holbrook Bodies (1920-1929)
Riley V.	1	3	Manu	Albion Drop Forgings (1904) Riley Engine Co (1914) Midland Motor Body Co (1932)

Source: Appendix II

The table shows that most of these key directors were derived from social class 1 and did not have an engineering background. Those who stated their occupation as manufacturer, such as Charles Hill, Alick Hill and Victor Riley,[82] came from wealthy Coventry families. Only William A. Oubridge, whose father was

[82] LOA, Interview with A.C. Farrer, former Riley worker, 24 August 1982.

a market gardener,[83] had any practical engineering experience outside of a family firm. Indeed, Baker, Bednell, and Lindley[84] can be best described as 'commercial men' since they had no engineering experience but a large network of contacts.[85] Alfred Bednell's career as a company agent made him an ideal advisor on business matters. This position was enhanced after his appointment as the government's official contracts agent during the First World War.[86] This may explain why at the end of the war Bednell was a director of at least two firms, T.G. John and Zephyr Carburettors, who had obtained large government contracts.[87] On the other hand, Alick Hill had gained a reputation within the Coventry business community both for his commercial enterprise and engineering skills. Born into a wealthy Coventry watch making family, he perceived himself as both inventor and entrepreneur. However, Hill's greatest asset was his 'tactician's eye for financial battlefields and the cut and thrust of commerce'.[88] This came to prominence when he successfully retained a powerful position on the board of Coventry Chain, the firm he founded, despite its public floatation in 1907. Indeed, throughout his chairmanship of Coventry Chain he was well known as being a tough negotiator. Thus, while the Midland Bank manager regarded Hill as a 'thoroughly capable man who has good experience in America', he noted after one particular meeting that he was:

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[83] LBA, B379a/19, 1 June 1911.
[84] Richardson, *Twentieth Century Coventry*, p. 30. *Coventry Standard*, 5 January 1951, 5. Lindley was a partner in the Coventry solicitors Rotherham and Sons.
[85] LOA, Interview with A. Jarrard, September 1973, Tape 132.
[86] H. Nockolds, *The First 100 Years*, Vol 1, (1976), p. 176.
[87] MBA 358/615, October 1910.
[88] Tripp, *Renold Chains*, p. 132

> a most difficult customer to deal with and he was in one of his obstinate [and] impossible moods. He asked for an overdraft of £20,000 and not withstanding repeated efforts of mine to get him to reduce the proposal to lower figures, he refused to discuss any other amount.[89]

The appointment of key directors with an insight into the motor industry also enabled firms to share resources. For example, shortly after Alick Hill joined Bluemel's board in 1913, Coventry Chain and Bluemel jointly opened sales depots in London and Manchester.[90] Significantly, Bluemel and Chain were not competing in the same markets, which enabled Hill to offer his experience in dealing with car assemblers to other firms within the car component industry. Consequently, by his death in 1921, Alick Hill had been a director of Coventry Chain since 1896, Bluemel Bros from 1913, and Smith's Stamping since 1917.

The importance of the personal contacts within the motor industry should not be underestimated, especially since many of the Coventry component firms did not possess an elaborate sales organisation. Although the employment of agents throughout the country was fairly common, agents were an expensive commodity and were often dispensed with at the slightest economic downturn. Consequently, orders won by agents were often haphazard and few and far between during periods of recession.[91] Moreover, the fact that Coventry, was an important centre for British Car production, ensured that it was imperative

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[89] MBA, 358/5 18 April 1907 and 358/9, 21 December 1910.
[90] MCL, M501/560.0124/CC 902/1f, Coventry Chain Minute Book 1902-1931, 16 December 1913 and 21 October 1914.
[91] A prime example of a firm which employed agents in an ad hoc manner was the Coventry Watch Movement Company who relied on 'friends' in the motor industry. see B. Beaven, 'The Growth and Significance of the Coventry Car Component Industry', pp.

for directors and managers of motor firms to integrate fully within the Coventry business community. The importance of integrating personally in the business community was not lost on William Morris who purchased components from a wide range of firms in Coventry. In 1928, it was recalled that Morris was:

> practically always on the doorstep of each of his manufacturers...otherwise he would find himself landed with, let us suppose, one hundred back axles and a dozen front engines, fifty frames and no bodies. Therefore, Coventry saw him at factories at six o'clock in the morning and ten o'clock at night...[92]

Similarly, the Lloyds Bank manager considered that Edward J. Hardy's early success in the car components industry stemmed from being 'well known to the manufacturers.' Prior to manufacturing car components, Hardy had been a 'traveller' for E. Lycett Ltd, a Birmingham cycle supply firm, before producing cycle components himself until 1903.[93] Hardy's reputation with manufacturers did, in fact, lead directly to a personal friendship with Knight of Daimler which resulted in large orders from the car manufacturer. In 1915, the two firms arranged a joint venture to the United States to publicise Hardy's new universal joint. The successful trip not only confirmed Daimler's faith in Hardy's new patent, but also ensured that Hardy secured a 'very big business and large profits for his firm'.[94]

The success of car component firms which drew contacts and knowledge from the Coventry business community is demonstrated by the fact that it was not only the traditional small firm which followed this practice between 1895-1939.

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[92] *Autocar*, 24 August 1928, p. 362.
[93] LBA, B379a/13, 29 May 1903.
[94] LBA, B379a/21, 6 October 1915. Adeney, *The Motor Makers*, pp. 148-149.

Even, British Thompson Houston, the American subsidiary company, participated in this informal approach to sales, a practice which overrode the sales departments and actually caused some conflict within the organisation. In common with the typical American subsidiary firms, BTH possessed a sales organisation which was controlled by a local sales director. However, in 1921, conflict broke out between A.P. Young, the new Managing Director of BTH's Coventry branch and W.C. Lusk the American sales director, over sales strategy. BTH had lost a number of magneto contracts with car manufacturers such as Humber and Morris through Lusk's unwillingness to negotiate reductions in prices. Indeed, Lusk's authoritarian control over the sales organisation, meant that salesmen were constantly having to clear deals with the sales director, an impractical strategy that went against the motor industry's traditional informal negotiation methods. This was recognised by Young who informed Lusk that:

> business in the motor trade is frequently transacted far from the wheels of toil, and most buyers in this comparatively youthful industry like to strike a bargain. It is appreciated that the sales organisation is to secure the best possible price, but I would contend that the certain knowledge that the salesman can, if necessary, drop his price to a bed-rock figure which he has clearly in his mind is a potent factor in determining whether or not the salesman will come away with an order after the interview.

Moreover, Young considered that Lusk's control over the sales department was too inflexible and ill suited to the demands of the motor industry, and consequently, he often ignored the Lusk's department and secured contracts himself. In obtaining new contracts, Young followed the traditional method in the motor industry and drew from contacts from the Coventry

business community. For example, in 1921, BTH secured an initial large contract for over 9,000 magnetos with Armstrong Siddeley after Young volunteered to fit a magneto in Dr Marriott's (a neighbour of Young) car. Young explained in his sales report that:

> I knew at the time that Dr Marriott was a very great friend of Mr Siddeley, and that it was quite obvious, therefore, that Dr Marriott's good experience with our magneto would be communicated to Mr Siddeley and the quality of the BTH magnetos would thus be bought very forcibly to Mr Siddeley's attention.[95]

The sales drive was then centred on Coventry since eight from the thirteen car assemblers that BTH succeeded in supplying were based in the city.[96]

Although historians have criticised British firms for lacking formal and centralised management structures based on the American model,[97] it is clear that this was an inappropriate system in the context of the Coventry car component industry. Thus, even American controlled subsidiaries began adopting an informal and flexible approach to sales that was rooted in the tradition of the British motor industry. The motor industry's informality and emphasis on personal relations was ingrained in the very institutions of the Coventry business community. For example, business contacts were often made through the network of middle-class recreational institutions which were scattered across the Coventry region. Fred Rees, who worked at Automachinery during the 1930s recalled that the top

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[95] MRC, MSS 242/BT/6/1, 'A.P. Young Collection', Production Department Report, 6 December 1921.
[96] MRC, MSS 242/BT/6/1, 'A.P. Young Collection', Production Department Report, Sales Figures 1921-1922.
[97] Chandler, 'Emergence of Managerial Capitalism', pp. 496.

management of the Coventry motor industry lived in the locality and met at certain venues:

> Major Dick [Automachinery's Managing Director] always went to lunch at Drapers Hall [in Coventry], always went every day...it was where all your top industrialists and professional people went...[98]

Similarly, John Siddeley, the managing director of Armstrong Siddeley, organised lunches for the leading industrialists in Coventry. His son, Ernest Siddeley, remembered that:

> On many occasions he used to have lunch in his own private dining room at the works. I think he called it politics and trade...my father would give a lunch one month another would give a lunch another, but they were all leading industrialists in Coventry.[99]

However, although a number of prominent car manufacturers, such as Percy Martin of Daimler and Captain Black of Standard, were members of the Ancient Fellowship of Cappers and Feltmakers of Coventry, the unofficial recreational centre for gentlemen involved in the motor industry was the Coventry and County Club.[100]

The 'Coventry and Country Club' was formed on January 3 1899 by a group of Coventry industrialists. Entry into the club was highly restrictive since the election of members was largely vested in the club committee. Prospective members could be refused entry if they were 'black balled' in the ballot, or if an existing member objected within two weeks of new names appearing on the notice board. The early club committees were dominated by the 'new' industrialists and included Alick Hill,

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[98] Taped Interview with Fred Rees, a former manager of Automachinery, 26 March 1933.
[99] LOA, Interview with Ernest Siddeley former managing director of Armstrong Siddeley, Tape 121, 1969.
[100] Jeremy, 'Percy Martin', *Directory of Business Biography*, 4, 1985, pp. 167-168.

who chaired the early meetings, George and William Du Cros and Alfred Bednall, businessmen who all had strong links with the early cycle and motor industries.[101] However, despite the exclusive nature of the club, the institution did not discriminate against gentlemen from fairly small concerns. Thus early members, such as C. Foster, of Coventry Magneto, W.A. Oubridge of British Piston Ring and W.J. Grindlay, the owner of Coventry Motor and Sundries, were able to mix socially with representatives from the major car manufacturers, which included Standard, Daimler and Rover. Moreover, entrepreneurs also had access to financial contacts since the Lloyds Bank manager noted in his daily journal that both 'Mr Brown of Midland Bank and Mr Blackburn of District Bank were members of the club'.[102] Certainly, the importance of the club for small firms was not lost on the new directors of Van Raden, who arrived in Coventry from London in 1919 having just purchased the firm, and immediately applied for membership.[103]

Membership of the club rose dramatically during the First World War since firms saw an opportunity to make new contacts that could lead to munitions deals either with the government or firms sub-contracting out. Significantly, one of the founders of the club was Alfred Bednell, the prominent manufacturing agent in Coventry and the Ministry of Munitions representative in the City during the First World War. Harold Nockolds vividly described the activities of Bednall, who by the 1920s was the Coventry agent for Lucas:

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[101] CRO, Acc 578, Coventry County Club, Minutes of General Meetings, 3 January 1899.
[102] LBA, B379a/13, 12 November 1903.
[103] CRO, Coventry and County Club, MB 1911-21, 11 March 1919.

> Bednall, who had been the Ministry of Munitions representative in Coventry during the war and knew everybody worth knowing in the district, operated largely from the bar at the County Club, which was the unofficial head-quarters of the motor industry in Coventry and where all the real business was done between manufacturers and their suppliers.[104]

The County Club's invaluable function, as a meeting place where deals could be struck, continued into the Second World War with businessmen joining as far a field as Birmingham, London, Essex, Hearts and Sheffield. Such was the notoriety of the club that one firm in Stoke-on-Trent even wrote to the secretary to request membership for their commercial representative. In 1943 the club reached a capacity of 300 members and consequently a waiting list of over 20 names was produced. Moreover, during this heightened time of popularity, applicants who resided outside a 50 mile radius of the club were refused entry.[105]

Conclusion

This chapter has shown that the Coventry car component industry was dominated by owner-managed family firms between 1895-1914. However, it has been argued that the family firm cannot be held responsible for the continued existence of the small scale units of production which characterised the industry during this period. Moreover, the chapter has maintained that historians who have asserted that American style management techniques should have been implemented during the interwar years have overlooked the socio-economic context of the

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104 Nockolds, *The First 100 Years*, (1976), 176.
105 CRO, Acc 578, Coventry County Club, Minute Book 1937, 1 October 1942, 25 March 1943, and 27 June 1947

period.[106] Family firms were open to external finance provided that a degree of autonomy was maintained. However, the highly competitive structure of the motor industry gave little opportunity for component suppliers to expand since there were few market opportunities and, consequently, external financiers were not forthcoming. Thus the small family firm was more a *symptom* of the structure of the component trade rather than the dynamic force shaping it. This chapter has also argued that, given the small scale nature of the industry, family firms did not suffer from the lack of formally educated personal. Of more significance to the component industry was the need to ensure that directors and managers were integrated fully into the Coventry business community, a necessity for an industry whose primary function was to supply car assemblers. The importance of the Coventry business community was reflected in the high membership rates of the Coventry County Club which, to many, was the 'unofficial home of the motor industry'. Indeed, the fact that BTH at times abandoned its official sales organisation in favour of securing informal contacts within the Coventry business community demonstrates its effectiveness. This community centred system only became outdated after the economic framework altered after the Second World War. The post war mergers in the motor industry provided the catalyst for the decline of the family firm and the Coventry business community, two intrinsically linked factors which had played a prominent role in the ownership and management of Component industry between 1895-1939.

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[106] For example see, Elbaum and Lazonick, 'Institutional Perspective', p. 5

Chapter 6.

Output, Technology and Standardization: Institutional Rigidities and the Coventry Car Component Industry.

For some time, neo-classical economics has figured prominently in economic history. This conventional approach to economic history assumes that market conditions approximate those of perfect competition, a factor which implies that wider institutional structures are constrained from having significant economic affects by virtue of competition.[1] Thus an industry's rise or decline can, on the whole, be attributed to the 'invisible hand' of the market. Recently, however, a new body of research has emerged which emphasises the importance of 'institutional rigidities' in shaping an industry's development. For example, Elbaum and Lazonick have attributed the decline of Britain's economy in the twentieth century to rigidities in its economic and social institutions. They state that:

> we attribute the decline of the British economy in the twentieth century to rigidities in the economic and social institutions that developed during the nineteenth century, a period when Britain was the world's leading economic power and British industry was highly atomistic and competitive in organisation. Our conclusions regarding British economic decline run directly counter to the neo-classical presumption that market competition is the best guarantor of economic well-being.

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[1] D. McCloskey, *Essays on a Mature Economy: Britain after 1840*, (1971). R.C. Floud, 'Britain 1860-1914: A Survey', in R.C. Floud and D. McCloskey (eds), *Economic History of Britain since 1700*, vol 2, (Cambridge, 1981).

Thus Britain's typical economic structure remained atomistic, a structure which impeded the exploitation of technical and organizational innovations.[2]

As chapter 3 has demonstrated, the atomistic character of Britain's economy resembled closely the structure of the Coventry car component industry. Indeed, the car component industry prior to 1914, has often been criticised for constraining the growth of the motor industry through its 'inefficient' practices. In 1959, Maxcy and Silberston suggested that the slow development and inefficiency of the British car component sector became a major restriction to the growth of the car industry. Some years later, Turner supported this analysis by claiming that 'it was the lack of an efficient component industry which was to handicap Morris and other British producers in the years before the First World War'.[3] Certainly, the growth of the car component industry was fairly slow during the first few years of the motor industry and output among component firms varied dramatically.[4] However, no historian has actually accounted for why output in the early car component industry varied according to the origin of the firm or the particular branch of the industry it was trading in. Moreover, whilst historians have been keen to pin the blame for a lack of rationalization and standardization on to the component industry, they have failed to address the other half of the

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[2] B. Elbaum and W. Lazonick, 'An Institutional Perspective on British Decline', in Elbaum and Lazonick (eds), *The Decline of the British Economy*, (Oxford, 1985), p. 2.
[3] G. Maxcy and A. Silberton, *The Motor Industry*, (1959), p. 13, G. Turner, *The Car Makers*, (1964), p. 19.
[4] B. Beaven, 'The Growth and Significance of the Coventry Car Component Industry 1895-1914', *Midland History*, 18, (1993), pp. 105-120.

equation, namely the role of the assemblers. This chapter will investigate three significant influences, the origin of a firm, the impact of the First World War and the role of the car assemblers, factors which may have constrained the growth of the car component industry.[5] These important influences will be analysed to establish whether they constituted institutional rigidities to greater output, standardization and the implementation of new technology within the car component industry between 1895-1939.

The Origin of a Firm and the Impact of the First World War: An Institutional Rigidity to Greater Output?

In 1915, a Ministry of Munitions report on the efficiency of Britain's engineering industries concluded that:

> no other country in the world could show such a high level of workmanship or so much out of date machinery. Repetition work on a large scale was comparatively rare in England, and a well equipped engineering firm produced an endless variety of articles, not always on a commercial scale.

Moreover, the report noted that many of the traditional engineering industries were 'marked by a rigid individuality'.[6] The report's findings on the nature of traditional engineering industries does shed light upon the productive practices of some Coventry component firms. Indeed, over half of the early

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[5] The origins of a firm and the impact of the First World War were selected since they have both been the subject of much debate surrounding the development of British industry during this period, see Elbaum and Lazonick, 'An Institutional Perspective', p.2, D. Thoms and T. Donnelly, *The Motor Car Industry in Coventry since the 1890s*, (1985), ch. 3. The important role the car assemblers played in shaping the component industry has been a neglected area of analysis and consequently it was an important theme to investigate.

[6] Public Record Office (hereafter PRO), MUN5/370/1126/1, Memo on Engineering Efficiency June 1915-Nov 1918.

Coventry car component industry was derived from the city's traditional firms such as the coach, watch and cycle trades. In 1912 thirty-one of the sixty-one car component firms had diversified into the motor industry from a traditional trade.[7] While firms involved in the cycle trade were conversant with 'repetitive' production techniques, firms with a history in the coach and watch industries had neither the experience or technology to adopt such practices. This poses the question of whether it was these branches of the component industry which in some way restricted the output of car assemblers.

The production of bodies during the early years of the motor industry were almost entirely derived from the traditional coach makers. The earliest motor car bodies were literally horseless carriages, as they possessed all the features of the horse-drawn coach minus the horse. A contemporary noted that coaches were 'equipped with a stationary motor and a speed changing mechanism of the simplest type'. Indeed, the coach only structurally altered after the engine was placed at the front of the vehicle.[8] Consequently, during the formative years of the motor industry coach firms continued with their traditional production practices which employed skilled craftsmen to produce carriages that were both highly individual and varied in design. For example, it was during this period that F.W. Lanchester, a pioneering engineer of the late nineteenth century experienced problems with his body suppliers. Recalling his experience of the early motor industry, Lanchester noted that:

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[7] Beaven, The Growth and Significance of the Coventry Car Component Industry', p. 108.

[8] D. Lyddon, 'Craft Unionism and Industrial Change: A Study of the National Union of Vehicle Builders Until 1939, (PhD Thesis, University of Warwick, 1987), p. 173.

> The difficulty of getting body work made on an interchangeable basis was due to the fact that the body builders would not work to instructions. In those days when a body builder was asked to work to drawings, gauges, or templates he gave a sullen look such as one might expect from a Royal Academician if asked to colour an engineering drawing...when the body work came it would not fit the chassis, and we had to cut the chassis about the body work in each individual case.[9]

However, since the output of car assemblers remained small during the formative years of the motor industry, the traditional coach building techniques did not restrict car production. Nevertheless, whilst firms using this technique could only achieve a fairly low output, one major change in producing bodies occurred prior to the First World War which was to divorce coach making from its nineteenth century origins. The introduction of metal panels, as oppose to traditional wooden ones, not only ensured that the body was designed around the requirements of a chassis, but also increased the output of coach firms.[10] Moreover, demand for the metal panelled body also encouraged new firms to enter the industry with no previous background of horse-drawn carriage production. This change in production technique occurred between 1908-1912, and coincided with the an increase in car production. It was during this period that car assemblers such as Singer, Calcott and Humber began producing new popular light cars designed for the affluent middle class.[11] Thus, even a traditional sector of the component industry had responded to the demands of the car assemblers since, by 1912, with the change in production

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[9] Ibid, p. 175.
[10] Ibid, p. 190.
[11] Beaven, 'The Growth and Significance of the Coventry Car Component Industry', p. 113.

techniques and the influx of new firms, a highly competitive industry had emerged.[12] However, not everyone approved of the new production techniques. As late as 1912, Mr Hobley, owner of Coventry Motor Bodies, complained that 'a properly built wood body is a coach makers job, and cannot be made by a combination of glorified joiners and tinkers'. Unfortunately for Hobley, his views were not shared by car assemblers and, by 1919, Coventry Motor Bodies had been wound up.[13]

The watch trade, another of Coventry's traditional trades, was also instrumental in providing car component firms. Once again, recently diversified firms had little option but to adapt their techniques to cope with the increase in demand for components after the 1907-8 depression. Indeed, Rotherham and Sons which began making a variety of small components such as petrol gauges, grease cups and motor watches were quick to re-organise their workshops from craft based techniques to more repetitive methods.[14] A journalist who visited the Rotherham factory in 1907 wrote:

> A visit to Messrs Rotherham's great watchmaking factory reveals the plan on which the division of labour is now carried into effect...the subdivision of labour is even more complete in this plan than in the older one, and machinery can be employed for making large quantities of *each part* also in a way that was not possible working on a more restricted scale in the former method.[15]

Similarly in 1904, the Coventry Watch Movement Company began re-organising the productive process around more

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[12] See chapter 3.
[13] Lyddon, 'Craft Unionism and Industrial Change', p. 191.
[14] Coventry Record Office (hereafter CRO), Acc 1457/143/1-2, *Rotherham and Sons Vehicle Catalogue*, (1906).
[15] CRO, J. Woodward, 'Rotherhams: Watchmakers', (unpublished report, 1975), p. 65.

repetitive techniques. Between 1904-1912 the Movement Company, despite making average net profits of only £100 a year, added over £1,500 of new machinery during the same period.[16] However, prior to 1904 the Movement Company had been reluctant to commit themselves to the motor industry. The main force behind this purchase of new technology was the highly competitive character of the component industry and the pressure exerted by the car assemblers. Indeed, it took a customer's threat in 1904 to withdraw their order unless an increase in production was achieved before the Movement Company purchased its first automatic machine.[17]

Whilst component firms which had been derived from the coach and watch trades re-organised their production largely through external pressure, some component firms were already conversant with repetitive production techniques. For example, firms with a history in the cycle trade were familiar with quantity production. Although, until the mid-1890s, British cycle manufacturers had catered for a middle-class market that emphasised quality rather than quantity, the threat of American competition forced cycle manufacturers to adopt more repetitive production practices. Thus by the late 1890s, firms such as Automachinery were producing long runs of cycle components using the latest American technology.[18] Likewise, Bluemel were one of the first suppliers to adapt plastic celluloid to their trade. This light material was ideal for components such as handlebar-grips, pumps and mud-guards which, unlike

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[16] CRO, Acc 542, Coventry Watch Movement Company Balance Sheets 1903-1912.
[17] See Chapter 3.
[18] A.E. Harrison, 'The Competitiveness of the British Cycle Industry, 1890-1914', *Economic History Review*, 22, (1969), pp. 294-299

conventional materials, could be quickly produced in large quantities.[19] Such was the transformation of production techniques in the cycle industry that by the turn of the century, the Americans 'were rendered almost incapable of competing with the British industry'.[20]

Firms with a background in military production also had a tendency to transfer the principles of rapid repetitive production to the manufacture of car components. As early as the Boer War, White and Poppe were producing large quantities of fuses for the War Office using a combination of skilled and semi-skilled labour and automatic machines. Indeed, the government would only award contracts to firms who could demonstrate that they could manufacture large quantities of military equipment in short time spans. Thus, in order to fulfil the War Office's contract worth over £40,000, White and Poppe secured a bank loan of £4,000 to purchase new automatic equipment.[21] The extent to which White and Poppe relied on automatic machinery and semi-skilled labour was demonstrated by H.F. Landstad who recalled that when he started work at the firm in 1901:

> the shops, where I first started, were very busy on the manufacture of time fuses and employed 60 girls and about 30 setters-up...the shops were so closely packed with machinery that it was impossible to avoid being splashed with oil. Indeed, everyone was soaked and stunk of paraffin at that time.[22]

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[19] *The Coventry Standard*, 7 March 1952, p. 7.
[20] Harrison, 'The Competitiveness of the British Cycle Industry', p. 299. For more information on the mass produced cycle see P. McLeay, 'The Wolverhampton Motor Car Industry 1896-1937', *West Midlands Studies*, 3, (1969), p. 102.
[21] Lloyds Bank Archive (hereafter LBA), B379a/11, 12 March 1900.
[22] Coventry Warwickshire Collection (hereafter CWC), *The Limit. White and Poppe Ltd*, 7, January 1919, p. 5.

After the Boer war, fuse production for the motor industry became White and Poppe's staple product after they won an order worth over £25,000 with Armstrong Whitworth in 1904.[23] However, this connection with the motor industry was to lead to White and Poppe manufacturing its most famous product, the motor car engine. Significantly, the firm did not greatly re-organise the productive process and, consequently, White and Poppe's workplace was far removed from the craft centred workshops often associated with early engine making.[24] In January 1906, White and Poppe's bank manager, wishing to investigate how the bank's loan had been invested, reported that 'I went around the works yesterday, which was very busy and fitted up with all the best machinery. They have an order for two sample engines from a London motor company worth £80,000...'. By October of the same year, White and Poppe had over £135,000 worth of engine orders from five different motor firms.[25] The firm's use of the latest technology to machine engine parts to interchangeable limits enabled White and Poppe to manufacture over 20,000 carburettors between 1906-1912 while production of engines had reached 2,000 a year by 1913.[26]

Another Coventry car component firm with a background in military production which was able to meet the increasing demands of car assemblers prior to the First World War was the Coventry Ordnance Works (COW). Established in 1906, the firm had originally been formed to manufacture military equipment,

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[23] LBA, B379a/14, 5 October 1904.
[24] T P. Newcomb and R.T. Spur, *A Technical History of the Motor Car*, p.33, *Autocar*, 4 February 1908.
[25] LBA, B379a/15, 12 January, 31 October 1906.
[26] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, (1962), p. 41. Thoms and Donnelly, *The Motor Car Industry*, p. 23,39.

but turned to the motor industry when government orders began to decline.[27] Significantly, like White and Poppe, COW transferred the repetitive production techniques of fuse making to car component production. In 1908, the Amalgamated Society of Engineers (ASE) complained that the fuse factory was 'quite notorious for cheap labour' and that 'most of the girls on fuses [were] being paid disgracefully low wages'. However, the ASE became increasingly worried when it noted that cheap labour and the repetitive production methods of the fuse section were being introduced into the newly opened car component shop. The Union noted that 'a large number of lads had been started on the motor-car work all at cheap rates of pay. [There was] not a single full rated man on this class of work'.[28] Moreover, COW's experience of quantity munitions production ensured that the firm was one of the first component suppliers to use production line techniques. Indeed, C.R.F. Engelbach, who was a production engineer at COW until 1921, utilised many of COW's ideas and techniques when re-organising Austin's productive process in the 1920s.[29] In 1918, it was reported that COW possessed the 'most modern and efficient machinery' for quantity production.[30] Moreover, such was the advanced nature of the firm's factory layout, that as late as 1930 COW's plant, which had not been re-organised since the end of the First World War, was described as a 'fine engineering shop'.[31]

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[27] See chapter 3.
[28] CRO, Acc 1243/1/1-14 (box 1), Coventry District of the Amalgamated Society of Engineers (hereafter ASE), minutes 1898-1914, 2 January, 28 January 1908.
[29] D. Jeremy, 'C.R.F. Engelbach', *Dictionary of Business Biography*, (1984), p. 289.
[30] *The Times*, 15 November 1918, p. 7.
[31] R. Jones and O. Marriott, *Anatomy of a Merger. A History of GEC, AEI, and English Electric*, (1970), pp. 130-1.

Finally, a car component firm with a background in munitions production which was to have the greatest impact on the motor industry was Hotchkiss et Cie. This concern moved from France to Coventry in 1916, and won a government contract to produce large quantities of machine guns.[32] After the war, when military orders rapidly declined, Hotchkiss, like White and Poppe and COW, modelled their production of car components on the techniques used in military production. In 1922, a reporter, from the journal *Machinery*, noted that engine production was carried out with the aid of 'many ingenious methods' that were used to produce machine guns. The report then proceeded to describe the principles behind their quantity production:

> the efficient arranging of the various manufacturing departments under competent supervision, not only ensure that the parts are machined in the shortest possible time consistent with accuracy, but also that the work moves in a continuous line through the respective shops from the time the raw material is issued from the stores until the finished units reach the development where they are packed and despatched.[33]

This production strategy was achieved by installing long conveyor belts that carried engine components, which joined the main assembly line at right angles by another set of controlled conveyors.[34] Between 1919-1922, Hotchkiss had produced over 20,000 engines and was the largest engine producing factory in Britain.[35] In May 1923, Morris, who was the engine firm's main customer, purchased Hotchkiss and almost immediately expanded

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[32] See chapter 3.
[33] The report was first published in the journal *Machinery* and later reprinted in a Hotchkiss publication. See CWC, Anon, *A souvenir of a Visit to the Hotchkiss Works, Coventry*, (Coventry 1922), p. 1.
[34] R.J. Overy, *William Morris, Lord Nuffield*, (1976), p. 85.
[35] CWC, Anon, *A souvenir of a Visit to the Hotchkiss*, preface.

output for the motor industry by closing down the machine gun shop and converting it to engine production. By mid-July 1923, Morris had increased production from 300 engines to 600 engines a week.[36]

Although firms which had originated from a munitions background were often successful in implementing production techniques to the manufacture of car components, the impact of the First World War had mixed fortunes for the component industry. The extent to which a car component firm benefited in terms of increased output and the purchase of new machinery hinged on whether the firm continued to manufacture pre-war products or diversify into military products. For example, a key war-time supplier was Coventry Chain, which in 1915 was forced to re-construct its finances in order to cope with the government's demand for an increased output. In order to meet the capital requirements, 100,000 preference shares at £1 each were created bringing the increased capital to £250,000. The company's net profits increased from just under £15,000 in 1914, to over £49,000 in 1920. Clearly then, the war enabled Coventry Chain to strengthen its position in the component sector. The reasons behind its success lay in the fact that the war seemed to have inflicted minimal disruption to the type of product produced and the company's customer relations. The directors' report of 1915 stated that their business mainly consisted of 'manufacture of driving and engineering chains and engine parts of motor cars, vans, lorries and planes'. Moreover, Coventry Chain continued to supply their pre-war customers such as

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[36] Overy, *William Morris*, p. 27. R.C. Whiting, *A View From Cowley. The Impact of Industrialization upon Oxford, 1918-1939*, (Oxford, 1983).

Daimler, Siddeley-Deasy, Rover, and Wolseley as well as expanding their markets in France, Russia and Italy.[37] Consequently, Coventry Chain's post war conversion back to civil orders was not as painful as rival chain makers.[38]

Likewise, ML Magneto's conversion to War Office work was swift and efficient. After securing a contract with the government, the firm refused any more orders from customers in the domestic car and cycle trade and turned the whole works over to manufacture magnetos and accumulators for military vehicles.[39] The large government orders between 1917-1918, permitted ML to invest over £25,000 on new machinery.[40] Moreover, with the introduction of volume production, ML could reduce the cost of individual magnetos. In February 1917, after, completing a War Office order for 5,000 magnetos, ML informed the Ministry that due to the new equipment the manufacturing costs of the next 5,000 'was now somewhat reduced...by 10/- per magneto'.[41] After the war, ML experienced little difficulty in converting back to domestic production since military magnetos differed very little from domestic designs. Indeed, their strong position within the magneto industry did not go unnoticed by competitors and consequently ML was subject to a take-over in 1919 by Smith and Sons of Cricklewood.[42]

Other firms which experienced minimal disruption included Van Raden, Smith's Stamping and Albion Drop Forgings. Van

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[37] CRO, Acc 594/143 Coventry Chain shares brochure issue 1915.
[38] B. Tripp, *Renold Chains. History of the Company and the Rise of Precision Chain Industry 1878-1955*, (1956), p.103,119.
[39] CRO, Acc 1107/1 ML Magneto Minute Book, 28 July 1916.
[40] Ibid, Outlay on machinery years ending 22 February 1917 and 12 March 1918.
[41] Ibid, 14 February 1917.
[42] Ibid, 20 August 1919.

Raden avoided the problems of converting their works into munitions shops and re-organising the productive process by successfully tendering a contract for military vehicle batteries.[43] Demand for stampings rapidly increased during the First World War when a prolonged strike by foundry workers encouraged many engineering firms who had previously used castings, to buy components made by the drop forging method. Moreover, the increased trade was centred on vehicle components. Smith's, for example, had little difficulty in converting plant to peace-time demands since out of £171,300 worth orders placed in 1917, £145,500 were for motor transport components.[44] The increased demand for stampings was reflected in Albion's inability to take on further business between August to October in 1914 as they were working to capacity with over £50,000 on their books. Such was the profitability of government orders that, in 1915, Albion purchased £10,000 worth of new plant and were planning a £20,000 extension to their premises.[45]

Not all firms, however, were able to continue their domestic products during the war, a factor which caused immense conversion problems. Paradoxically, COW, which had formerly manufactured military equipment, were consistently unable to meet government production targets.[46] The transition from producing car components to shells, fuses and guns was surprisingly difficult considering the company's history of producing armaments. Such was the company's pre-war

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[43] CRO, Acc 1562/66/1, Van Raden, 'Jubilee Report', (unpublished typescript, c1949).
[44] CRO, Acc, 634/1, Smith's Stamping Minute Book, 1903-1918, 16 February 1917.
[45] LBA, B375a/21, 30 October 1914, 27 September 1915.
[46] PRO, MUN 5/373/1200/5, 'History of the Supply of Guns from COW, October 1914-July 1917', (1917).

commitment to producing car components that at the outbreak of war, no orders for armaments had been placed with the firm for five years and therefore only a small staff were conversant with the manufacture of field guns.[47] Along with the problems of re-training labour, firms were confronted with the difficulty of converting or purchasing new machinery in a bid to increase production. In the case of the relatively large Ordnance Works the government funded the purchase of a number of automatic machines in the belief that it would speed up production. However, COW discovered to their cost that new machines were often unreliable. A Ministry of Munitions inquiry into faults 'occurring in a large proportion of the firm's output', reported that defects were due 'partly to a defective machine...and partly due to the employment of men new to the particular work involved'. By 1916, these setbacks prompted the Ordnance management to report that work in progress was 'very behind schedule'.[48] Table 6.1 demonstrates the extent of the problems and the degree to which COW fell short of the projected targets set by the Ministry.

[47] Ibid.
[48] Ibid.

Table 6.1
The promised and Actual Output of COW Nov 1915-April 1916

	TARGET	TARGET	ACTUAL	ACTUAL
Month	18" Powder Cases	4.5 Howitzer Guns	18" Powder Cases	4.5 Howitzer Guns
November 1915	5,000	6,000	850	-
December	5,500	8,000	4,500	-
January 1916	8,000	18,500	9,350	-
February	8,000	30,000	7,850	2,950
March	10,000	17,500	8,650	6,850
April	8,000	14,000	8,100	7,650

Source: PRO MUN 5/6/170/8, 'COW Report Showing Plant in Existence and Labour for the Manufacture of Shell Components', 25 May 1917.

Table 6.1 shows clearly the that it was not until December 1915 that COW managed to exceed their target for 18" powder cases. However, the real problem lay in the Howitzer gun shop which due to 'defective machinery and shortage of skilled men' did not enter into production until February 1916. Even after production began the numbers produced fell drastically short of the output promised to the government. The reason behind the differences in production totals between the cases and guns once again rest with the shortage of skilled labour. The powder boxes could be easily manufactured using semi-skilled labour, while gun manufacture required the extensive use of skilled workers. Moreover, although the Ordnance Works had gained experience in gun production between 1905-1909, their output during this period averaged only 340 per year. Thus to achieve the production level required by the Ministry, the Ordnance Works could not replicate their pre-war production practices since they were not geared towards volume production.

The impact of war also forced the Coventry Movement Company to re-evaluate their product strategy and diversify into

new areas. In October 1914, it was reported that 'some important orders had been suspended, other had been reduced'. These orders were mostly derived from the motor car trade, and consequently the firm had little choice but to comply with the government demands and start manufacturing aircraft components.[49] Moreover, many of the firm's problems stemmed from the need to purchase new materials and plant and manufacture unfamiliar products. Thus in 1915 the treasurer informed the board that reduced trading profits were due to 'the taking up of new classes of work in consequence of the war and the rigidity of government inspection resulting in certain work being scrapped'.[50] The firm received little help from the government since after receiving £1,500 for their first order completed in 1916, the Movement Company had to withdraw £1000 to pay for the materials and plant used in the contract.[51] Even in 1917, when the firm considered starting a night shift to cope with the increase in demand for aircraft parts, the board reluctantly concluded that even 'if it was found possible to start a night shift further capital outlay would be required in connection with motors and other matters and no profit from the additional output could be expected'.[52] The shortage of working capital was a major problem for many small firms since the war often forced firms to work beyond their means. For many small component firms the purchase of new machinery was too expensive. Many simply fitted their existing multi-purpose machines with new and relatively inexpensive jigs and fixtures.

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[49] CRO, Acc, 542/1 Coventry Movement Company Minute Book 1913-1932, 26 October 1914.
[50] Ibid, 25 March 1915.
[51] Ibid, 31 January 1916.
[52] Ibid, 27 August 1917.

These machines could then produce long runs of shells or other war material, performing a limited range of tasks, as if they were specially designed machines.[53] Thus the source of the problem was not generally connected with the inability to buy new machinery but the necessity of purchasing large orders of raw materials. It was reported by the local bank manager that, the British Piston Ring Company, which possessed a 'fairly small capital', had 'done exceedingly well' prior to the war. The firm was almost £3000 in credit in August 1914, yet eight months later the British Piston Ring Company was £500 in debt due to necessity of buying in large quantities of raw materials for war time orders.[54]

The first section of this chapter has argued that the origin of a car component firm did have a bearing on the firm's ability to increase its output. For the firms that had previously been involved in Coventry's traditional trades, the conversion from craft based to more repetitive and less skilled techniques was often inaugurated by the external pressures of a highly competitive market structure.[55] However, despite the external nature of the conversion, the traditional car component firms did not restrict the production of assemblers since the high entry rate of firms during the crucial period 1908-1914 gave assemblers many sourcing options. A major force in this highly competitive environment were the firms conversant with repetitive production techniques which usually possessed a background in either the cycle or munitions trades. Moreover,

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[53] W. Lewchu k, *American Technology and the British Vehicle Industry*, (Cambridge, 1987), p. 158.
[54] LBA, B375a/21, 12 August 1914, 21 April 1915.
[55] See the introduction to this chapter.

this section has also shown that the First World War had both a positive and negative affect on the component industry. Clearly, firms which were permitted to continue to manufacture their pre-war product gained in both rapid production techniques and new plant over those which were forced into diversifying into munitions. However, whilst the origin of a component firm and the impact of war were important factors in determining the nature of a firm's initial output, they cannot be considered as a long-term rigidity in the system which in some way held back car production. An over-riding factor was the highly competitive market structure which was influenced by the purchasing practices of the assemblers. Consequently, in explaining the fairly low output levels of the early car component industry (between 1896-1906) and the continued low output of some component firms to 1939, it is perhaps more fruitful to examine the demands placed on component firms by car assemblers.

Output and Standardization: Car Assemblers' Demands as an Institutional Rigidity

Whilst historians such as Maxcy, Silberston and Turner, identified the low levels of production by component firms as a significant factor in explaining the slow growth of the industry, little attention has been focused on the demands made by car assemblers. This section will argue that far from restricting the production practices of assemblers in Britain between 1895-1939, the level of output and standardization in the component industry was dictated by the car assemblers themselves. The highly competitive market allowed the assemblers frequently to

order both small and large runs of components with a variety of different designs.

Nevertheless, the question of standardization was discussed by both assemblers and component makers throughout the period understudy. The first serious attempt within the motor industry to encourage the standardization and interchangeability of components was made in 1912. A conference entitled the 'Standardization of a Automobile Parts' was convened by the Engineering Standards Committee in London in July 1912. The committee, chaired by sir John Wolfe-Bury, decided to draw up a list of components that could be manufactured to a standardized pattern. The committee which had representatives from the War Office, GPO, AA, SMMT, and Institute of Mechanical Engineers concluded the conference by noting that 'The greater the tendency, as in England, to draw from a large number of factories, the greater the economic necessity for standardization'.[56]

The practicalities of pursing such a policy were fraught with difficulties for assemblers which needed to balance the call for standardization against the necessity to preserve its individuality in the market.[57] For example, Standard Motor Company, founded at Coventry in 1903, immediately proclaimed that their underlying goal was to produce a standardized car. In December 1905, the Chairman, Reginald Maudslay reported that 'after spending a considerable sum in experiments, the company had standardized their pattern and the cars now built appeared to be turning out satisfactory'. This was to prove a false dawn in

[56] *The Times*, 3 July, p. 25, 27 August, p. 8 1912.
[57] *The Times*, 5 March 1913, p. 24. For an analysis of the British car market see chapter 7.

the standardization of components. In fact several different models were produced in small quantities with frequent modifications.[58] In 1910, Maudslay argued that Standard should manufacture a small car for the popular end of the market, a project which would require an increase in production and the purchase of longer runs of components. However, Maudslay's suggestion that car production should be doubled to batches of fifty was rejected by Standard's chairman Charles Friswell:

> It was generally acknowledged that the previous system of working one batch after the other would have to be abandoned and the works would be so organised to give delivery of the various models more or less simultaneously. It was pointed out that this would be more costly, consequently less conducive to profit...[59]

Thus an overriding factor in Standard's decision not to enter the popular end of the car market was not the lack of a reliable component supply but a reluctance to re-organise their productive process. The production of a small popular car was finally undertaken in 1913, after Friswell had resigned from the board.[60] However, like other firms producing early volume cars such as Riley, Singer and Humber, Standard did not change its strategy of purchasing short runs of components. Car assemblers discovered that the highly competitive component industry did not make the purchase of long runs of standardized components an economic proposition. Moreover, given the seasonal nature of the car trade, the purchase of small runs of components avoided an unnecessary build up of stock during the

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[58] Jeremy, 'C. Friswell', *Directory of Business Biography*, (1985), p. 433.
[59] University of Warwick, Modern Records Centre (hereafter MRC), MSS 266/ST/1/1/1, Standard Motor Company Minute Book 1903-1914, 19 April 1910. See also Jeremy, 'R. Maudslay', *Dictionary of Business Biography*, (1985), p. 197.
[60] Jeremy, 'R. Maudslay', *Dictionary of Business Biography*, p. 197.

winter months when car sales in Britain declined.[61] Low switching costs encouraged assemblers to continue to order short runs of components from specialist suppliers since this strategy allowed them to switch to more competitive rivals should they emerge. The car assemblers' dominance over their suppliers was one of the key reasons why output remained fairly small for many component firms and why Standardization did not materialise until after the Second World War.[62]

For Coventry car component firms, the problems of short runs of components and the lack of standardization was particularly acute during the interwar period. A major reason for this was that during this period, Coventry became the focus of assemblers which targeted the luxury market.[63] The fact that Coventry became dominated by luxury car makers (such as Daimler, Lea Francis, and Alvis) which required short runs of components encouraged the entry into the industry of a number of small component firms, a situation which perpetuated the difficulties for existing supply firms. Indeed, the luxury car makers continued use of antiquated production practices had a direct affect on the supply sector. For example, although Lea Francis purchased almost all of its components from outside suppliers, the firm consistently ordered only short runs of components. Thus bodies supplied by Charlesworth, axles and gear boxes from Armstrong Siddeley would be ordered in batches of between ten and twelve even after the Second World War.

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[61] *The Motor*, 30 July 1907, p. 794, 14 January 1908, p. 764.
[62] The power relationship between car assemblers and car component industry is discussed more fully in chapter 7.
[63] CRO, A.T. Mallier and M.J. Rosser, 'Industrial Decline in Perspective. The Coventry Car Industry', (unpublished staff seminar paper'), Coventry Polytechnic, 47, January 1982, p. 8.

Moreover, as late as the 1930s the engine shop continued to use the traditional method of scraping engine castings to fit the components. Chris Beaven, a Lea Francis worker during this period, recalled that:

> We would all get a sack truck and pick up a complete engine block from a field behind the factory [which had been left to harden], and we would take the engine back to the shop...Then we would get it sand-blasted and we would scrape the engine block until the crankshaft and con-rod would all fit...it took us four to five days to do each engine.

The engines were then tested individually and if the engine did not run smoothly it was dismantled and the engine block and components were scraped and ground down once more. Such a system did not utilise components with shell bearings that allowed greater standardization and eliminated the need for engine blocks to be scraped individually. Although volume car makers such as Morris, Standard and Singer were using shell bearings, Lea Francis continued ordering short runs of non-standardized components.[64] However, short runs of non-standardized components were not only the requirement of Coventry's quality car makers but were also required by the volume producers. Indeed, car assemblers engaged in volume production tended to reserve Coventry firms for more specialised products. Nowhere was this more apparent than the body building sector.

Of the big six car manufacturers of the 1930s Morris, Rootes and Standard purchased bodies from Coventry firms. However, even Morris purchased only small quantities of luxury bodies for

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[64] Taped interview with Chris Beaven, former engine worker at Lea Francis, 18 September 1993.

the MG car from Hollick and Pratt and Charleswoth during the 1920s and 1930s. Morris continued only to order specialised bodies from Hollick and Pratt after taking over the firm in 1923 as he perceived that the high labour costs and restrictive practices in the Coventry coach trade militated against the city becoming an area of mass production.[65] Similarly, Humber and Hillman purchased only small batches of bodies from a variety of Coventry firms such as Holbrook bodies and Coventry Motor and Sundries. Rootes' mass produced car, however, was centred on the Hillman Minx, for which mass produced bodies were purchased from Pressed Steel in Oxford.[66] Until the 1920s, Standard had sourced bodies out to a number of Coventry firms such as Midland Light Bodies, Holbrook Bodies and Swallow. However, in an attempt to increase production the board decided to 'wherever possible' make bodies within the factory.[67] Indeed, between 1931-1933, Standard purchased only 97 bodies from Swallow and 51 bodies from Holbrook bodies. The major orders for bodies after 1936 were derived from Fisher and Ludlow which had sited a new factory near Standard in the Canley district of Coventry.[68]

The medium sized and luxury car producers also used Coventry coach firms for more specialised work. Although Rover produced most of its bodies within its own factory or through Midland Light Bodies in which it had a controlling interest, the car firm utilised Coventry's specialised coach

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[65] P.W.S Andrews and E. Brunner, *The Life of Lord Nuffield*, (Oxford, 1955), p. 127.
[66] Lyddon, 'Craft Unionism and Industrial Change', p. 242.
[67] MRC, MSS 266/ST/1/3/1, Standard Board Minutes 1923-1970, 25 August 1925.
[68] MRC, MSS 266/ST/1/3/1, Standard Board Minutes 1923-1970, 11 June 1932, 3 June 1933.

sector. During the 1930s, which saw car assemblers engaging in 'competition by variety',[69] Rover employed an agent to handle the orders for specialised bodies. Nine different coach builders produced 34 different bodies. A third of these firms, Charlesworth, Swallow and Car bodies were located in Coventry.[70] Riley, followed a similar strategy by ordering large quantities of bodies from its subsidiary Midland Motor Body Company. Riley ordered small batches of more specialised bodies from the small Coventry firm Hancock and Warman. Likewise, Armstrong Siddeley, built the majority of their bodies in-house, sourcing only small quantities to Holbrook Bodies in the late 1920s.[71] Although both Alvis and Lea Francis, were luxury to medium producers, neither firm possessed a coach building shop and consequently relied heavily on local coach builders. However, to ensure switching costs were low and to avoid an over dependence on one supplier, both firms spread their orders across a variety of coach firms. Firms supplying Lea Francis included Charlesworth, Cross and Ellis, Holbrook Bodies and Carbodies, while Lea Francis relied on Robinsons, Cross and Ellis, and Avon of Warwick.[72] Daimler's sourcing policy resembled other luxury car makers since it spread its body orders over a wide range of suppliers. In 1930, Coventry suppliers included Charlesworth, Carbodies, Barker, and Hancock and Warman. Significantly, each individual order did not exceed 100 bodies and, instead, for larger orders Daimler

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[69] See chapter 2.
[70] Lyddon, 'Craft Unionism and Industrial Change', pp. 246-7.
[71] CRO, Local History of Coventry, Tapes, 79,80.
[72] CRO, Acc, 985/1/1, Alvis Minute Book 1925-1934, 3 February 1928, 21 September 1932, Acc 985/1/3 Alvis MB 1935-39, 21 February 1936.

sourced outside of Coventry.[73] For example in 1934 Daimler placed an order with the Birmingham company Mulliners, which was conversant with new production techniques, for 3,000 bodies.[74]

The net affect of the car assemblers' body policy was to increase the number of small body firms that used fairly traditional body building techniques. Indeed, it was estimated in the 1930s that it would require the assembler to purchase at least 5,000 identical bodies from an all metal pressing firm to cover tooling costs.[75] It was perhaps no surprise then that car assemblers turned to firms using the more traditional composite methods of body production, especially during the 1930s when competition between assemblers was characterised by frequent changes in car design.[76] Clearly, the type of product that car assemblers' demanded from Coventry coach firms had a constraining affect on this particular branch of the component sector. However, evidence drawn from other sectors of the Coventry component industry also demonstrates that assemblers took advantage of the highly competitive environment in which supply firms operated.

In only a few cases did an assembler make an investment in their supply firm to increase production. In 1907, Daimler's investment in Albion Drop Forgings and in Coventry Chain, was directly related to Daimler's desire to increase rapidly its supplies of forgings and chains.[77] Indeed, within two years,

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[73] CRO, Acc 594/143 Daimler Collection, 'Purchase of Bodies 1930'.
[74] MRC, MSS 226/ST/M/1/1/2, Mulliners (Holdings) Minute Book, 13 July 1934.
[75] Lyddon, 'Craft Unionism and Industrial Change', p387.
[76] See Chapter 7.
[77] LBA, B379a/16, 6 February 1907

Daimler's investment had enabled Albion to improve its technology. In 1909, the Lloyds bank manager commented that Albion 'have just put down a big hammer which with accessories cost £2,900 over deferred payment. This he [manager of Albion] says will pay itself in two years. It is principally for Daimler work'.[78] Between 1909-1912, Albion increased their turn over with Daimler from £9,000 pa[79] to £30,000 pa. This large increase in output was achieved only after Albion had invested over £9,000 in new plant and machinery. However, £6,000 of this investment was derived from Daimler debentures to be repaid within the following four years.[80] By 1914, Albion's yearly turnover stood at £60,000, largely through the demand and investment by Daimler, a factor recognised by *The Coventry Graphic*. After a tour of the Albion factory, a journalist, noting the advanced technology, commented that:

> The growth of one industry generally gives rise to another, both being interdependent; and thus while drop forging has furnished the motor car with parts of the utmost lightness and strength, the motor industry by requiring such essential parts has given great impetus to drop forging.[81]

Similarly, Coventry Chain experienced a marked expansion in plant and factory size after Daimler's investment. Between 1904-1907, Chain had grown 'satisfactory' with little additional plant, personnel or factory extension. However, within ten years, factory size had increased from 68,000 square feet to over 1,000,000 square feet and the number of workers at Chain had risen from 420 to 1,240.[82]

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[78] LBA, B379a/18, 14 June 1909.
[79] Ibid, 9 August 1909.
[80] LBA, B379a/20, 16 September 1912.
[81] *The Coventry Graphic*, 27 February 1914, pp. 22-23.
[82] MBA, 358/5, 18 April 1907. Manchester Central Library (hereafter MCL), M501/061.5 CC 907/1 Renold and Coventry Chain Archive, 'The

Daimler's investment in key suppliers was to prove the exception rather than the rule. Increased output and investment in new technology for most Coventry car component firms was determined by the nature of the car assemblers' demand. For example, small firms such as Pistons Ltd were often perceived by assemblers as 'secondary' suppliers. Gordon Parsons, the former Managing Director of Pistons, recalled that volume production for suppliers was almost impossible as firms, such as Swift, Lea Francis and Humber, would often approach Pistons at short notice for small runs of components. In the 1930's Parsons remembered that 'when Lea Francis was in financial trouble, the main suppliers would not supply them so they came to us'. Thus, not only was the order small and temporary, but also, there was a real possibility of not being paid. Consequently, investment in new technology was rare. Throughout the interwar period and after, Pistons' basic plant was derived from a 1920s investment programme after Ford had placed a temporary order with the firm. Parson's later asserted that this was a significant moment in the firm's history as it was 'the great day...when we bought a centreless grinding machine'. From then on, Pistons Ltd did not have the financial resources to purchase new machinery and had to resort to adapting existing machine tools.[83] Another firm which was unable sufficiently to invest in new technology was the nut and bolt producer, Automachinery. The car assemblers' practice of using 'secondary' suppliers meant that their demands were often inconsistent. The repercussions

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Development of Coventry Chain 1907-1931', (unpublished Report 25 November 1931).

[83] Taped interview with Gordon Parsons, former Managing Director of Pistons Ltd, 16 October 1992.

for Automachinery were threefold, since components could not be standardized and capital was tied up in stock, which subsequently ensured that investment into technology was low. Fred Rees, who worked at Automachinery during the 1930s, vividly described the technological problems faced by component makers.

> No one wanted to know that we were an old-fashioned company where money hadn't been spent, where you hadn't been updating your machinery, eventually in later years they tried to set standards for making a bolt. The car people never understood us bolt making people, you can't run a bolt making company like you can a car company...they think we had brand new machinery working to 90% efficiency...when a machine broke down we had to cannibalise another one to get it going, and they never understood it, they didn't want to understand it. It was a headache.[84]

The problems of investing in new machinery did not simply affect individual firms, but in some cases, whole sectors of the component industry lacked new technology. For example, one sector which was consistently criticised for using dated machinery was the stamping branch of the component industry. In 1925, Bernard Brett, Chairman of the Drop Forging Association observed that:

> some of the equipment has been running for many years, and although the appliances fulfil their duty, in these days of strenuous competition every body has to look around to see where economy can be effected.[85]

Firms involved in the stamping branch of the component industry were required to hold high stock levels in a multitude

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[84] Taped interview with Fred Rees, former Managing Director of Automachinery, 26 March 1993.

[85] CWC, B. Brett, 'Some Remarks on Drop Forging Equipment. A Lecture given before Members of the Drop Forging Association 1925', (unpublished Report, 1925).

of components which consumed much of their reserve capital that could have been invested in new machinery.[86] Also, new technology, such as 'Double Action Steam Hammers', which could have speeded up the productive process, were unsuitable for small batch production. Thus although Smith's Stamping was criticised for inadequate machinery, Mr Clark (the Managing Director) concluded, after a visit to America, that U.S. production techniques could not be adapted to British demands.[87] For example, car assemblers required Brett's Stamping to make up to ten different stampings ranging from clutch pedals to connecting rods. Moreover, each car assembler demanded that Brett's produce the components to their own specifications, a process which required the supplier to produce dies that were unique to each car assembler.[88] Consequently, the motor industry's depression in 1921, which resulted in bankruptcy for a high number of small Coventry car assemblers, left many stamping firms with a wide range of obsolete dies and stock[89]

In some cases, however, the assemblers' demand for small runs of non-standardized components was exploited by suppliers. The production policy of Van Raden and Company changed significantly after the firm was sold to the Starley and Rankin families in 1919. Prior to the take-over, Van Raden had attempted to supply car assemblers with a whole range of electrical components. As early as 1903, Van Raden produced eleven different accumulator coils, six varieties of spark plugs

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[86] See later section of this chapter on the accumulation of component stock.
[87] CRO, Acc 634/1, Smith's Stamping Minute Book 1918-1939, 26 April 1922, 29 September 1925.
[88] CRO, Acc 1167/1, Brett's Stamping, Works Order Book c1914-1920.
[89] See Chapter 7 which analyses the problems that Smith's Stamping faced during the 1920s.

and five varieties of carburettor. By 1916, the highly competitive electrical sector of the component industry and the demands placed by car assemblers, required Van Raden to produce 46 different accumulators, six different lighting sets, and 31 varieties of ignition coils. Clearly this was a position that Van Raden could not sustain since much of its working capital had become locked into outdated stock.[90] After the take-over, Rankin and Starley rationalised the production strategy by concentrating on the manufacture of short runs of specialised car batteries. The electrical branch of the component industry had, by the 1920s, become fiercely competitive with the emergence of the all dominating Lucas group. Van Raden found it impossible to break Lucas' hold on the volume car battery market since the Birmingham based firm could afford to offer assemblers special deals involving a whole range of electrical equipment. Eric Starley, a former Managing Director of the firm in the 1930s, recalled that:

> Lucas took over the supply of electrical equipment to [car] manufacturers which included the battery, so if the [car] manufacturer didn't have the battery, Lucas would knock ten bob off or something which wasn't enough to buy a battery from elsewhere.

Moreover, even larger battery firms found it almost impossible to break into the battery market due to Lucas' domination of a range of electrical goods. The large battery manufacturer Chloride complained that during the 1920s and 1930s:

> when it attempted to obtain business from another of Lucas' initial equipment customers, Lucas made use of its advantage by quoting or suggesting a very low 'deletion

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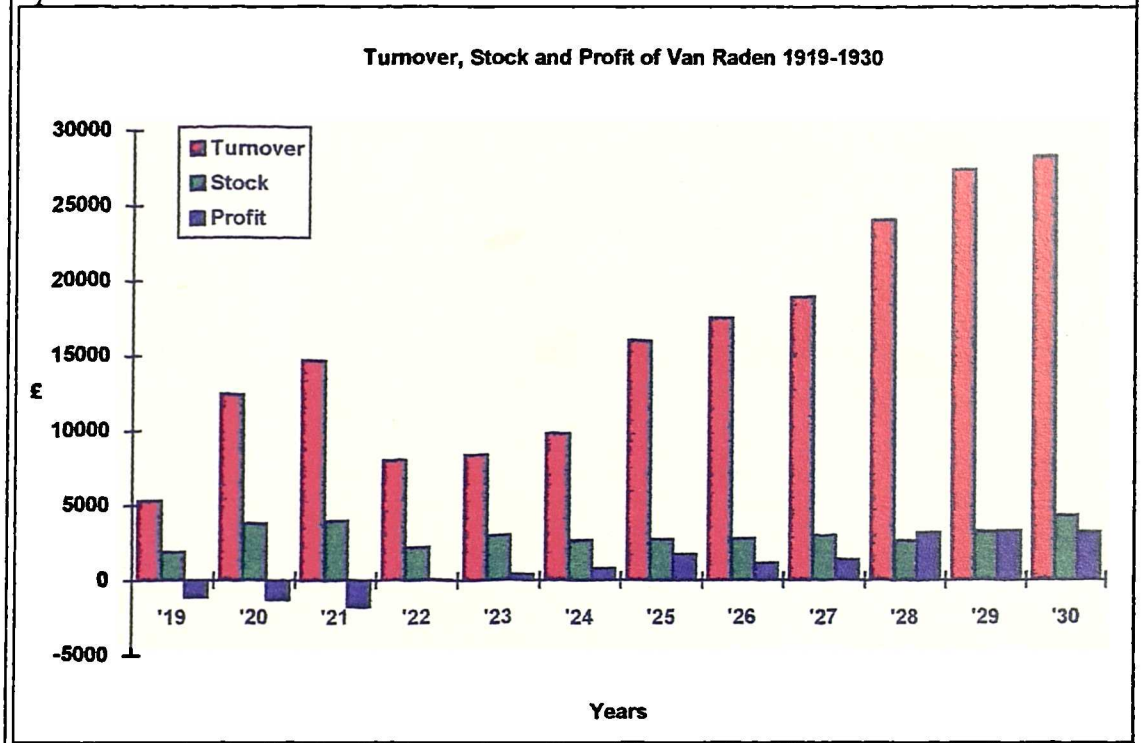
[90] CRO, 1562/29/14, Van Raden Collection, *Van Raden Trade Catalogue*, (Coventry, 1903, 1916).

price' for the battery to the customer who wanted to buy a set excluding the battery.[91]

Unable to compete in the volume battery market, Van Raden began making small runs of specialist battery for the quality sector of the car market. Table 6.2 shows that by reducing the range of goods offered, Van Raden was not only able to increase its turnover, but also ensure that stock levels remained fairly low.

Table 6.2

Van Raden's Turnover, Stock and Profits/Loss after Product Specialisation 1919-1930.



Source: CRO, Acc 1562/9/1-59, Van Raden balance sheets 1919-1930.

The largest output of car batteries was achieved immediately prior to the Second World War when it reached just 500 per week. Indeed, such was the specialised nature of their product, that by 1939, Van Raden was making over 300 different types of battery. Moreover, the small levels of demand, meant that Van

58 House of Commons, *Monopolies Commission Report on the Supply of Electrical Equipment for Mechanically Propelled Land Vehicles*, 18 December 1963, p.68.

Raden could not purchase and sustain automatic machinery until after the Second World War. Although, two automatic machines were purchased in 1927, they became too expensive to run and consequently, 'one was smashed up and the other was exported to India as a water pumping machine'.[92]

Although the assemblers' practice of selecting small Coventry firms as temporary suppliers ensured that many component firms were unable to buy or sustain automatic machinery, another demand of the assemblers had an equally negative affect on the component industry. The assemblers' insistence that suppliers accumulated high stock levels to safeguard themselves from bottlenecks in car production meant that much of the component firm's capital was locked in stock. The problems for car component firms were intensified as the stock was non-standardized and, consequently, supply firms were in a vulnerable position if an assembler decided to switch suppliers. Moreover, this problem was not confined to small component firms. The British Thompson Houston Company (BTH), a major supplier of magnetos to the motor industry, was frequently required to hold large stocks of components to cope with the sudden demands made by assemblers. During the early 1920s, BTH's Production Department came under severe criticism by the firm's sales manager for its large accumulation of stock. However, the high stock levels were defended by A.P. Young, the Managing Director, who stated that suppliers were 'expected' to make immediate shipments of orders with:

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[92] Taped interview with Eric Starley, former Managing Director of Van Raden (later Radenite Batteries), 2 October 1992.

> no information prior to the estimate from the Sales [Department] as to the quantities to be made from the stock. This is exactly in regard to the recent Triumph order...On the one hand Mr Garton [Sales Manager] is commenting on the excess stock being made by the factory, and on the other hand places an order for 290 [magneto] machines, 170 of which have to be delivered immediately.

Young concluded by claiming that the Sales Department did not appreciate the 'large range and variety' of magnetos that the assemblers required BTH to stock.[93]

Similarly, Dunlop's Rim and Wheel factory in Coventry experienced severe stock problems during the early 1930s. The depression of the late 1920s to early 1930s resulted in a considerable excess of supply over demand, and subsequently, stocks of tyres, rims and wheels mounted rapidly in the hands of the component manufacturers.[94] In 1932, the Coventry board reported that 'there was a decrease of £17,525 in our gross profits as compared with the year 1931. Although the volume of our business was actually increased, the selling prices were reduced to meet competition'.[95] The price cutting that followed was a direct result of high stock levels and forced Dunlop to explore more profitable manufacturing activities. Indeed, by 1936, the profit on car wheels had reached such a low level that the firm decided to target aero components as its staple product. In the same year, Dunlop Rim and Wheel's gross profits had increased from £81,166 to £121,038. The board reported that

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[93] MRC, MSS 242/BT/6/1, A.P. Young Collection, 'Production Department', 6 December 1921.
[94] House of Commons, *The Monopolies and Restrictive Practices Commission. Report on the Supply and Export of Pneumatic Tyres*, 8 December 1955, p. 6.
[95] Greater London Record Office (hereafter GLRO), Acc 2166/18, Dunlop Rim and Wheel, balance sheet 31 December 1932.

the marked increases shown were mainly due to a rapid development of:

> aero equipment and increased cycle rim sales. In addition, the gradual decline in the wire wheel trade, where the margin of profit was very low, has resulted in a higher per cent of gross profits in 1936 in comparison with 1935.[96]

Between 1930 and 1939, Dunlop reduced its manufacture of wire wheels from 283,141 to 40,304 a year, whilst the production of aero components increased from 2,284 in 1931 to 75,472 in 1939.[97]

The impact that high stock levels had on a component firm's efficiency is explored in Table 6.3 which analyses the surviving evidence for stock and turnover levels of five car component firms between 1919-1939. The ratio was calculated by dividing turnover by stock levels which indicates how efficient a firm was in dealing with its stock. A firm which recorded a low ratio possessed a poor relationship between turnover and stock. The table shows that all five firms possessed high stock levels as even a ratio of 12 did not represent a particularly efficient relationship between stock and turnover. Indeed, the ratio of 12 indicates that Van Raden possessed 19 days of excess stock at any given time during this period.[98] The table also suggests that Dunlop's diversification from the car rim and wheel sector to the aero sector was a factor in the firm's improved ratio between turnover and stock. However, the surviving evidence for the

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[96] GLRO, Acc 2166/22, Dunlop Rim and Wheel Balance Sheet, 31 December 1926,

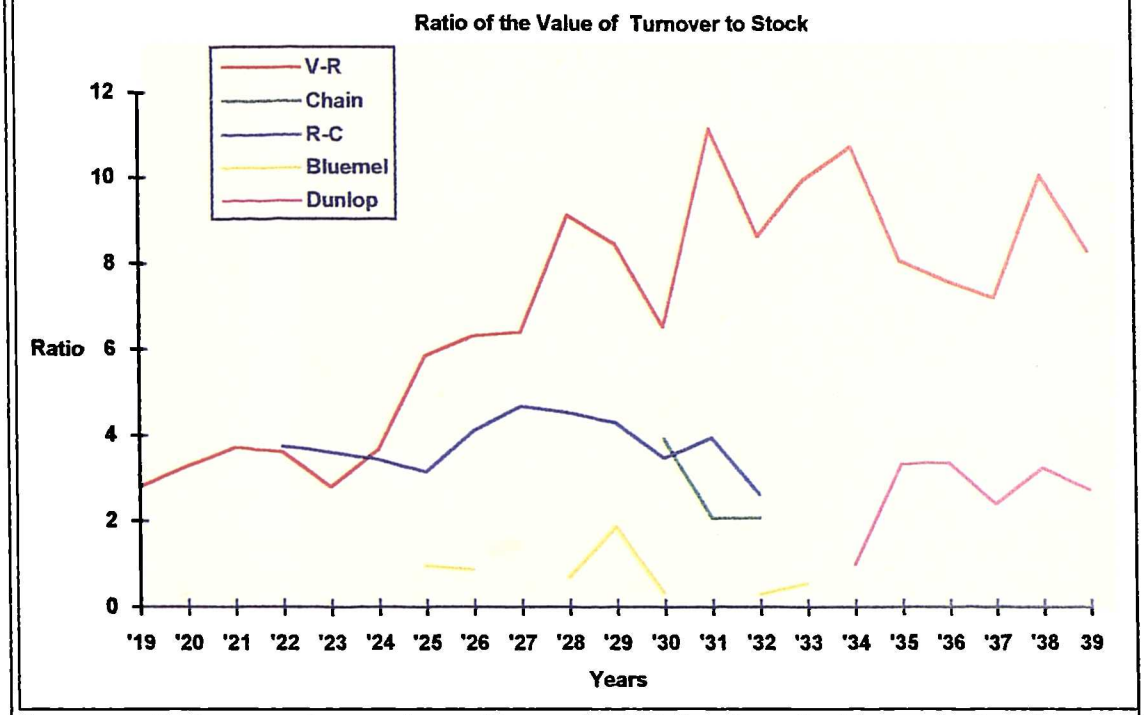
[97] GLRO, Acc 2166/15-16,25, Dunlop Rim and Wheel Balance Sheets, 31 December 1930,1931,1939.

[98] Current stock levels held by car component firms are between 1 to 2 days. Information supplied by Hill Precision, Coventry.

Bluemel firm illustrates the high stock levels that small component

Table 6.3

The Ratio of the Value of Turnover to Stock of Five Car Component Firms, 1919-1939.



Source: Balance sheets for: Bluemel (CRO, Acc Daffern & Stephenson Collection Acc 606; Van Raden (CRO, Acc 1562/9/1-59); Coventry Chain (MCL,M501/657.41/CC922/3);RenoldChain(MCL,M501/657.41/HR9031/1); Dunlop (GLRO, Acc 2166/18-25).

firms had to endure. Between 1925-1930, Bluemel rarely recorded a ratio above 1, a figure which indicates that the value of stock levels was actually higher than the value of turnover. For example, in 1925, Bluemel's stock was valued at £38,674 while its turnover only reached £37,979. Fortunes did not improve the following year as the stock was valued at £38,344, over £5,000 more than the turnover.[99] The evidence is consistent with the premise that car assemblers demanded component firms hold high levels of stock. Moreover, the table suggests that stock accumulation was a problem for all sizes of component

[99] CRO, Acc 606, Daffern and Stephenson Collection.

firms since it includes two small firms (Van Raden and Bluemel), two medium sized firms (Coventry Chain and Renold Chain) and one large company (Dunlop).

The car assemblers' requirement that component firms held large amounts of non-standardized stock had significant repercussions for the degree of research and development in the industry. Indeed, during period when firms experienced a shortage of capital, investment into research and development was usually the first programme to be dispensed with. For example, during the 1920s when competition in the electrical branch of the component sector was at its most fierce, shortage of capital, brought on by the large accumulation of stock, forced ML Magneto into some drastic action. In September 1925, the chairman reported to the Board that severe cut backs had been made 'by stopping all development, research improvements, etc. in fact anything which involved immediate outlay for deferred'.[100] Certainly, the highly competitive nature of the component industry, particularly in the electrical sector, meant that rate of innovation and technological improvements to car components were fairly low. Thus, some components which were manufactured in a highly competitive branch of the industry remained at an early stage of technical development. Indeed, in 1920, a motoring correspondent noted that:

> when it considered what immense praise had been lavished on various parts of the motor car, and to what degree of excellence some of them have been raised from the old standards of inefficiency, it is astonishing that what is perhaps the most important organ of all should have shown practically no progress at all in the past 10 or 15 years.

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[100] CRO, Acc 1107/1, ML Magneto Minute Book 1915-1925, 9 September 1925.

> The carburettor of today, taken in the mass, is very little improvement on the best of 1905.[101]

Consequently, innovation and research was confined to the branches of the component industry which were less competitive. Thus firms which patented their own components such as Coventry Chain and Cornercroft cornered the market of their particular product which, in turn, ensured that some capital was available for research.

This section has argued that the firms within the Coventry car component industry were characterised by short runs of non-standardized components, low investment in technology and the high accumulation of stock. However, these characteristics did not materialise through an inefficiency inherent within the component industry but had emerged from an institutional rigidity related to the assemblers. Indeed, the demands placed on Coventry car component firms by assemblers presented an institutional rigidity within the motor industry to greater output, standardization and the implementation of new technology in the component sector. The following section will analyse the extent to which component firms combined to rationalize output, technology and stock levels, in a bid to manipulate assemblers demands.

Responses to Institutional Rigidities: Associations, Monopolies and Mergers

The extent to which car component firms attempted to manipulate the demands made by the car assemblers was demonstrated by the fact that almost every branch of the trade possessed a trade association. Moreover, the emergence of the

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101 *The Times*, 10 April 1920, p.6.

highly competitive market, made it imperative for suppliers to try and act in unison to avoid the problems of price cutting.

The key objective of car component associations was to strengthen the suppliers' bargaining position with the car assemblers. Significantly, however, most of the trade associations emerged just after the First World War when demand for car components exceeded supply due to the difficulties in sourcing raw materials. Thus it was during this period that the stamping sector formed an association as it was 'the only means whereby drop forgers can meet and exchange their views', as a 'means of obtaining mutual strength'.[102] Likewise, the shortage of nuts and bolts ensured that the Nut and Bolt Association was 'fairly strong' immediately after the First World War. Fred Rees, a former Managing Director of Automachinery, recalled that throughout the interwar period nut and bolt producers sought 'protection against the car assemblers' and it was informally agreed between suppliers 'not to undercut each other too much'. However, such arrangements were often difficult to adhere to, as the evidence drawn from the chain making sector of the car component industry demonstrates clearly.[103]

The increase in the manufacture of chains during the First World War, combined with the post war demands of car assemblers, raised the question of standardization. It was not long before the chain industry experimented with a trade association - the Association of British Chain Manufacturers

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[102] CWC, B. Brett, 'Some Remarks on Drop Forging Equipment. A Lecture Given before Members of the Drop Forging Association, 1925', (unpublished Report 1925).

[103] Taped interview with Fred Rees, former Managing Director of Automachinery, 26 March 1993.

(ABCM)[104] In 1918, The ABCM was formed 'in an effort to regulate competition'. The association included all of the major chain makers such as Coventry Chain, Hans Renold and Brampton Brothers. The association's objectives were focused on the standardization of components and the creation of a price list to undermine the car assemblers' bargaining power. The association was successful as long as demand exceeded supply, a situation which prevailed in the chain industry immediately after the First World War. The association was able to exploit the deficiency in chains by publishing price lists that enabled component firms to enjoy generous profits. In 1920, a letter from Alick Hill, Managing Director of Coventry Chain, to Arthur Brampton chairman of the ABCM, outlined the increased profit margins which the published list had brought component firms:

> The prices that have been ruling are, as far as my company is concerned, fictitious and as long as demand greatly succeeded supplies, naturally one has little objection...even at the figures named in the new schedule, at the same time taking into consideration the discount proposals, the prices thus arrived at would still be materially on the high side, judging by costs.[105]

The association was successful when chains were in demand. However, with the advent of harder times, car assemblers were once more able to undercut component firms as, one by one, they withdrew their membership from the association. By 1923, it was noted that the ABCM 'had lost most of its importance'.[106] Thus, in terms of protecting supply firms when it was most

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[104] B. Tripp, *Renold Chains*, p. 112.
[105] MCL, M501/658.61/HR 918/1f, Renold Chain Collection, Association of British Chain Manufacturers, Letter from A.S. Hill to A. Brampton, 5 June 1920.
[106] MCL, M501/658.61/HR 918/7, Renold Chain Collection, Association of British Chain Manufacturers, (unpublished report on the history of the association), n.d.

needed, from the highly competitive environment and the demands of assemblers the ABCM had been a failure. Moreover, since the association had only been in existence for six years, it did not have sufficient time to pursue a programme of chain standardization. For example, it was calculated that as late as 1930, there existed over 1,000 different varieties of vehicle chain.[107]

The failure of trade associations was often due to a large component maker attempting to enforce standardization of components by gaining a monopoly position in the industry. If this position was attained by a supplier, it was perceived that car assemblers would have little option but to alter their inflexible requests for short runs of non-standardized components. An example of a Coventry component firm which followed this policy was the British Thompson Houston Company (BTH) of Lower Ford Street. BTH was one of Coventry's largest component firms and had diversified into producing car magnetos during the First World War. In similar circumstances to the chain industry, a trade association, the British Ignition Apparatus Association (BIAA), was established during the First World War. On the surface it seemed that BTH was in favour of the organisation. Indeed, A.P. Young, a former Managing Director of the Coventry factory, later wrote in his autobiography that the Association nurtured a 'spirit of co-operation' between small and large firms alike and that it:

> set a pattern in the industry, which if it had been followed in other industries during the past half century, the face

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[107] MCL, M501/650.021/R&CC 931/1, Renold Chain Collection, R.G. Renold, *Rationalization of the Management of Companies Under a Merger*, (n.d.) p. 8

> and spirit of British industry would have completely changed. The ugly face of capitalism would have indeed disappeared.[108]

However, in private during the 1920s, Young was concerned that there were 'far too many separate and distinct firms engaged in the business' which had encouraged car assemblers into demanding small runs of non-standardized magnetos. In a confidential memorandum to H.N.S. Sporborg, the Chairman of the company, Young declared that:

> there is a wonderful opportunity for some magneto manufacturer to rapidly force themselves into a dominant position by the adoption of a bold and comprehensive policy. In the process, some of the smaller firms will undoubtedly go out of business, and the economic basis of the industry will thereby be improved...I firmly believe that the BTH Company could achieve such a position.[109]

The BIAA, like the chain association, collapsed by the early 1920s due to BTH's aggressive price cutting policy.[110] However, despite gaining a major stake in the magneto market, BTH was unable to enforce standardization practices on the car assemblers. By the late 1920s and early 1930s, car assemblers began using alternative ignition devices to the magneto, and consequently, BTH was forced into diversifying from the motor to the aero industry.[111]

The quest for monopolising the chain market was one of the motivations behind the take-over of Coventry Chain by Renold Chain in 1930. Although officially described as a merger, it is

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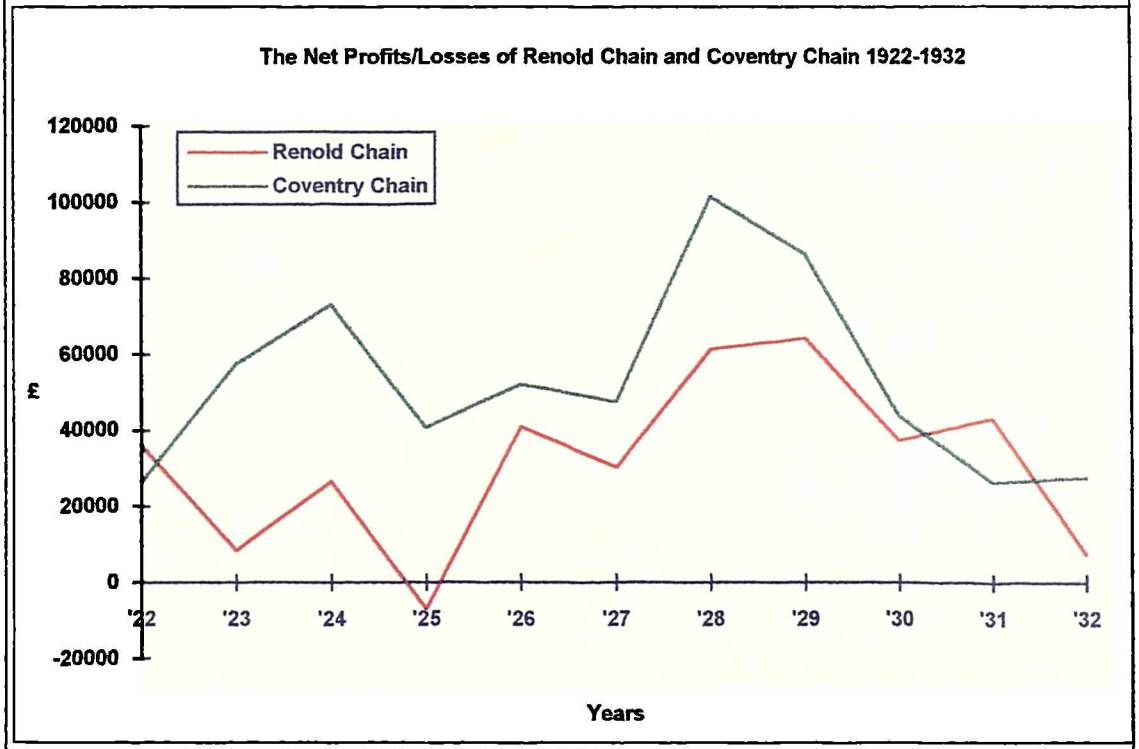
[108] MRC, MSS 242/BIO/8, A.P. Young Collection, 'An Industry is Born', (unpublished autobiography', (n.d.) p. 29.
[109] MRC, MSS 242/BT/6/1, A.P. Young Collection, 'The Magneto Situation', c1921.
[110] For the affect that price cutting had on the magneto industry see CRO, Acc 11071/1, ML Magneto Minute Book 1915-1925, 16 August 1923. Also see chapter 3 on the changing structure of the magneto sector of the component industry.
[111] See chapter 3.

clear that the amalgamation of the two firms was not conducted on an equal basis. The collapse of the Association of British Chain Manufacturers in 1923 had an adverse affect on Renold Chain's profits. Without the protection of the association and in order to retain its customers, Renold was forced into some drastic price cutting to compete with Coventry Chain who consistently recorded higher net profits between 1923 to 1930. Table 6.4 shows the net profits of both Renold Chain and Coventry Chain between 1922-1932.

Table 6.4

The Net Profits/Losses of Renold Chain and Coventry Chain 1922-1932



Source: MCL, Acc M501/657.41/CC922/3, Coventry Chain Annual Accounts 1922-1932; Acc M501/657.41/HR903/1, Renold Chain Annual Accounts 1922-1932.

The table shows the extent to which Renold relied on the association, since after its demise in 1923, net profits fell rapidly recording a loss of nearly £10,000 in 1925. By contrast, Coventry Chain's close relationship with Daimler ensured that

profits did not drop below £40,000 prior to the take-over, and reached over £100,000 in 1928. The table also reveals that Renold was making very little progress in displacing Coventry Chain's dominant position in the chain making sector. By the late 1920s, Charles Renold the Managing Director of Renold and the architect of the take-over, had reached the conclusion that Renold's bargaining position with car assemblers could only be enhanced if Renold and Coventry were amalgamated. Charles Goff disclosed in a stormy AGM in 1932, that Renold had approached Coventry Chain three years earlier with a threat of instigating a price cutting war if the Coventry firm did not agree to a merger:

> When the amalgamation negotiations started the Managing Director [Charles Renold] thoroughly frightened Mr Kendrick [Coventry's Chairman]...by saying he was going to reduce the prices of chains. That was a big bluff, and he could not afford to do it. The Renold Company was head over heels in debt.

Indeed, at this point Renold was in debt to the bank for over £100,000. In the same meeting a former Coventry Chain director, A. Whitehouse complained that the Coventry Chain shareholders had 'made a present of Coventry Chain's assets to Hans Renold' and that they now had 'no more control in the affairs of the combine than the man on the moon'. Whitehouse went on to explain that the 'primary products have been transferred to Manchester and a large part of the Coventry works is shut down'.[112] Renold's new found position as the dominant producer of chains on the British market did enhance its

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[112] MCL, M501/HR 650.021/930/1, Personal Papers of Charles Renold, 'The Renold and Coventry Chain Co Ltd. Verbatim Report of the Annual Meeting of Shareholders, held at the Renold Works, Didsbury Manchester, Thursday 17 November 1932.

position with car assemblers which, in turn, led to a greater stanardization of chains after 1930. By 1934, the variety of products produced at Coventry had decreased from thirteen to six different products, whilst the number of different chains the company (including Manchester) produced was reduced from 2,764 to 622.[113]

One strategy employed by the electrical branch of the component industry to reduce the bargaining power of car assemblers, was the creation of 'manufacturing rings'. Here, the large component manufacturers attempted to publish price lists that undercut smaller firms outside of the association. Moreover, firms also engaged in product demarcation which, in effect, enabled large firms to possess a manufacturing monopoly over certain products. The component manufacturers' justified their attempts to attain a monopoly position in their staple product by claiming that it would increase the standardization of components. The large battery maker Chloride declared that 'the United Kingdom battery industry needed "rationalisation" between the wars, and that by its acquisitions of other businesses it was, in effect, taking the initiative in this respect and making the company "the nucleus of that rationalisation"'.[114] Despite Lucas' assertion that it had never been their policy to 'drive out competitors by making and selling cheap and inferior goods' but instead 'to confine competitors to the part of the business which we did not desire to hold', rivals saw Lucas'

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[113] MCL, M501/650.21/R&CC931/1, C. Renold, *Rationalization of the Management of Companies Under a Merger*, (c1934), Appendix VI.
[114] House of Commons, *Monopolies Commission Report on the Supply of Electrical Equipment for Mechanically Propelled Land Vehicles*, 18 December 1963, p. 347.

involvement in 'The Ring' rather differently.[115] Eric Starley, a former Managing Director of Radenite Batteries (formerly Van Raden), recalled that when intense competition in battery manufacturing emerged in the 1920s to 1930s, his small business became the target for the larger manufacturers:

> there was a thing called 'The Ring' with all the big manufacturers like Lucas and Chloride...in the early thirties they all got together to make cheaper batteries under peculiar names...such as Pearl and Sapphire and was obviously done to undercut the smaller manufacturers...we just carried on producing our quality batteries.[116]

Certainly, the electrical branch was one of the few sectors of the component industry which experienced any success in product demarcation and monopoly markets since, by the 1920s, the sector was dominated by large firms, such as Lucas, Smith and Sons, and Chloride. However, in a report on the major car component firms, the *Monopolies Commission* noted that the dominant stance of the car assemblers in relation to the size of orders and standardization of components still prevailed. It concluded that Chloride 'does not appear immediately to have employed its market strength to develop the large scale production of standard products. Like Lucas, it could not have made much progress before the war in the direction of standardisation without the co-operation of the motor industry'.[117] Indeed, the market dominance of Lucas in the electrical sector of the component industry did not exempt the

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[115] House of Commons, *Monopolies Commission Report on the Supply of Electrical Equipment for Mechanically Propelled Land Vehicles*, 18 December 1963, p. 54.
[116] Taped interview with Eric Starley.
[117] House of Commons, *Monopolies Commission Report on the Supply of Electrical Equipment for Mechanically Propelled Land Vehicles*, 18 December 1963, p. 347.

firm from having to produce fairly small runs of non-standardized designs. In a speech to the Lucas A.G.M in 1930, Oliver Lucas outlined the difficulties that car component firms had in standardizing products.

> One of the biggest difficulties on the manufacturing side has been the further increase in the number of models and patterns we have to produce. It is unfortunate that this should be necessary. It is a definite handicap in fighting American large production. Instead of being able to keep out machines steadily at work, we have to stop them far too often to change tools...

Lucas, concluded by revealing the extent to which car lamps were non-standardized. He complained that both the external and internal components of the lamps had to be unique for each customer 'to ensure the individuality of his car'.[118] Thus, even the bargaining power of these major electrical firms was not enough to overcome the institutional rigidity of the car assemblers demand.

Conclusion

This chapter has analysed the factors which determined the output, technological implementation and the extent of product standardization in the Coventry car component industry. The research has demonstrated that short run factors, such as the origin of a component firm and the importance of the First World War did have a bearing on a firm's ability to produce long runs of components using the latest technology. Unlike firms with a traditional background, firms conversant with the cycle and munitions trades smoothly switched their repetitive production techniques to the car component industry. The First

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[118] *The Times*, 30 October 1930, p. 23.

World War, however, had mixed fortunes for component firms, as the implementation of new technology hinged on whether they were able to continue to manufacture their pre-war product. Post-war conversion, for many firms, proved difficult since the new plant was of little use in domestic production. Whilst these were short term factors, the chapter has identified an institutional rigidity within the motor industry which car component firms had difficulty in surmounting. The demands of car assemblers often dictated the supply firms' output, implementation of technology, stock levels and the extent of product standardization. Moreover, the assembler's powerful position in the relationship with their suppliers was not restricted to small suppliers but also large firms with near monopoly status. The highly competitive structure of the industry (analysed in chapter 3) ensured that switching costs were low throughout the interwar period, a characteristic that affected both large and small firms alike. Thus the car component industry's trade associations and combines were to achieve little success when it mattered, in times of economic depression. Once this evidence is taken into account, it is clear that the Coventry car component industry was not 'inherently inefficient', but simply responded to the demands placed upon it by the car assemblers, who more often than not required short runs of non-standardized components. This institutional rigidity within the motor industry was highly significant in shaping the car component industry. The following chapter will investigate the origins of this institutional rigidity by analysing the relationship between the car assemblers and car component makers and will raise the question of why backward integration

was not extensively adopted in the British motor industry between 1895-1939.

Chapter 7

Backward Integration in the British Motor Industry: The Experience of Coventry Car Component Firms 1895-1939

The 'decline' of the British economy has often been linked with the failure of manufacturing firms to integrate vertically the productive process. Indeed, both Chandler and Lazonick view Britain's failure to adopt the American model of business organisation with its emphasis on vertical integration, as a major factor in Britain's economic decline. Certainly, the low levels of integration in Britain's motor industry was in stark contrast to the American automobile industry. Thus, throughout the interwar period, whilst British car firms purchased between 65-80 per cent of components from external suppliers, American auto firms bought only between 25-30 per cent of components from specialist suppliers.[1] This chapter will analyse the origins and development of the supply relationship between car assemblers and car component makers between 1895-1939. In analysing the relationship between car assemblers and car component makers, attention will be focused on the production strategies employed by assemblers, the significance of research, development and re-tooling costs, and the credit arrangements between buyers and suppliers. However, this investigation will

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[1] G. Maxcy and A. Silberton, *The Motor Industry*, (1959), p. 27, R.N. Langlois and P.L. Robertson, 'Explaining Vertical Integration: The Lessons from the American Automobile Industry', *Journal of Economic History*, 49, (1989), pp. 368-9.

be set against the major structural changes in the motor industry and the development of the domestic car market in Britain in a bid to explain why car assemblers continued to draw extensively from the component industry.

The Years of Transition 1895-1908

The British motor industry between 1895-1908 was characterised by the high number of firms entering and leaving the car industry. Indeed, the transitionary nature of the industry is demonstrated when it is considered that of the 221 car firms that were founded in Britain between 1901-1905, at least 112 had failed between 1906-1910.[2] Table 7.1 shows that between 1898-1906, the output of cars in Britain was erratic and small, and consequently, the demand for specialist component producers was low.

Table 7.1
Approximate Output of Cars 1900-1905

Firm	1900	1901	1902	1903	1904	1905
Albion	1	21	35	33	65	128
Argyll	-	25	60	100	300	-
Austin	-	-	-	-	-	-
Daimler	150	-	-	250	-	-
Humber	-	-	-	-	-	1,000
Napier	-	-	-	-	-	299
Lanchester	-	8	50	75		-
Sunbeam	-	-	-	-	100	161
Swift	-	-	24	-	-	-
Vauxhall	-	-	-	43	76	-
Wolseley	-	-	-	-	-	450
Total	**151**	**54**	**169**	**501**	**541**	**2,038**

Source: S.B. Saul, 'The Motor Industry in Britain to 1914', Business History 5 , 1962, p. 25.

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[2] S.B. Saul, 'The Motor Industry in Britain to 1914', *Business History*, 5, 1962, p. 23.

The low levels of car production between 1895-1908 encouraged many car assemblers to produce the whole car themselves. One observer during this period noted that 'in England there are a few factories that buy complete engines from one or two firms, but for the most part even the smallest shop tries to make its own parts.'[3] For example, in 1924, a journalist remembered that the first Sunbeam Car had been produced entirely by one manufacturer.

> It is gratifying to recall that the power plant of the first Sunbeam car was built throughout by John Marston Ltd in 1899. The parts were cast locally and bored by that parent enterprise which built the radiator. Even the spark plugs used were made by the firm. Which car builder in the world to-day makes his own sparking plugs?[4]

Likewise, when the Rover Company belatedly entered into car production it produced a variety of components including carburettors, spark plugs, clutches, gears and lubricators.[5] The car makers' attempt to produce the whole car was not limited to large car manufacturing concerns. Small firms, such as Payne and Bates, a Coventry car producer at the turn of the century, possessed a factory complete with a drawing office, pattern shop, foundry, machine shop, fitting and test shop, paint shop and show room.[6] Indeed, during the formative years of the

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[3] A.E. Berriman, *The Materials of Motor Car Production*, (London, 1912), 24.
[4] The Sunbeam Motor Company, *The History and Development of the Sunbeam Car 1899-1924*, (Wolverhampton, 1924), p. 17.
[5] University of Warwick, Modern Record Centre (hereafter MRC), MSS 226/RO/1/1/2, 21 March 1906.
[6] London University, Pollitt Papers, Book 1, 8/108, Letter from F.S Payne to Pollitt 25 February 1946.

motor industry, car manufacturers took great pride in proclaiming that they had designed and produced most of the vehicle themselves. In 1908, an observer commented on the prevailing attitudes of the motor manufacturers:

> All the larger firms show a disposition to adopt the motto: 'direct from the raw materials to the motorist: no middle man: no sub-contracting: no intermediate profits'. They make - with the exception of the ignition coils and pneumatics - the whole car under one factory roof.[7]

The car firms' strategy of attempting to produce the whole car was not only intended to cut out the middle man, but was also used for marketing purposes. In a market which was becoming increasingly competitive due to a large influx of motor manufacturers entering the trade, it became important for a firm to stamp its own individuality on its cars. The practice of introducing variety and individuality onto small runs of cars was made easier when the manufacturer produced most of the car itself.

However, after this experimental stage of the motor industry had subsided, the lack of a supply sector became a recognised problem. Contemporaries such as Frederick Lanchester, one of the pioneering engineers of the late nineteenth century motor industry, recalled that:

> the difficulties of management were very great partly owing to the fact that no ancillary trades had been developed, and we had to do everything ourselves, chassis,

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[7] Anon, *Motors and Motoring*, (1908), p. 84.

> magneto, wheels, body work, etc., everything except the tyres.[8]

Consequently, during this transitionary stage, the few firms which supplied important components, such as engines and chassis, were invariably motor car manufacturers themselves. The larger car manufacturing concerns did not suffer from a shortage of capital and could therefore afford the expensive experimental costs. In 1901 W.H. Thomas, the manager of the Motor Manufacturing Company, outlined the importance of car manufacturers in supplying components to smaller firms.

> Some of the principal cycle firms who started in the motor business by making their own motors have since dropped the engine making finding it cheaper and more satisfactory to purchase motors already made and fit them into their own frames. Altogether we supply something like 36 firms with motors alone to be fitted to various cars of their own construction.[9]

However, the most prominent component supplier during this period was Daimler. Prior to the First World war, Daimler enjoyed a close relationship with Rover, supplying the firm with variety of miscellaneous components and, later, whole engines.[10] In 1911, Daimler also provided the Deasy Motor Company with sets of engines after it had repeatedly failed to produce its own engine. Significantly, when supplying other companies, Daimler imposed some strict demands within the agreements. The purchasing company had to agree not to buy engines from other

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[8] D.R. Litlewood, 'The Location of the British Car Industry 1888-1940', (unpublished MA thesis, University of Leicester, 1962), p. 14.
[9] Coventry Warwickshire Collection (hereafter CWC), A. Lowe, 'City of Coventry', (1901-02), 2-4.
[10] R. Whipp and P. Clarke, *Innovation and the Auto Industry*, 1986, p. 61.

suppliers and, secondly, Daimler insisted on a deposit of 5 per cent of the total value of the order and the full payment in cash on delivery of the products.[11]

However, while the manufacture of components lay in the hands of the car makers, the majority of smaller firms still found it uneconomic to buy supplies from outside sources. The car producers' demand of cash on delivery, caused severe cash flow problems for small car makers. Two small firms which pioneered the concept of buying components were Climax and Sturmey Motors. Sturmey Motors which was established in 1903, bought bodies from Hollick and Pratt and engines from Willans and Robinson from Rugby. However, without the extensive in-house production facilities, the firm was unable to survive the post war re-structuring of the motor trade.[12] A similar fate was to await Climax which was established in 1904. On the concern's formation, the manager of Lloyds Bank noted that 'they are buying cars from a French company and in some cases are purchasing the chassis from E.J. West...I should think they have a reasonable probability of doing well.'[13] Despite the bank manager's optimistic assessment of Climax's unusual production methods, the firm lasted only three more years before entering into liquidation.[14]

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[11] MRC, Mss 226/RO/1/1/3 Rover Minute Book 1909-1917, 28 November 1910; Coventry Record Office (hereafter CRO), Acc 1060/121/1 Contract between Daimler and Deasy 18 September 1911.
[12] Lloyds Bank Archive (hereafter LBA) B379a/13, 22 July 1903.
[13] LBA, B379a/ 14, 23 December 1904.
[14] LBA, B379a/16, 20 September 1907. Morris of Oxford was the first concern to buy extensively from component suppliers. However, Morris

The Turning Point: The Car Makers' Use of the Component Sector 1908-1914

The turning point in the car manufacturers' use of component suppliers occurred between 1908-1914. It was during this period that car assemblers, such as Morris, Singer, Standard, Calcott Bros and Humber, began producing new light cars designed for the more affluent middle class. These cars, which were produced in larger batches than previous designs, were miniature versions of the larger prototypes but with an engine capacity limited to 1500 c.c.[15] Although the extant census data does not distinguish between private and commercial vehicles, Table 7.2 does demonstrate effectively the concerted increase in production which followed the erratic and small totals achieved during the formative years of the motor industry. The increase in car production together with the depression in the cycle industry encouraged a number of cycle firms to enter the car component trade. Consequently, the relatively high influx of new entrants during this period allowed the car producers a greater selection of concerns dealing in supplies. Although most firms did not follow Climax and Sturmey by attempting to build cars entirely through the assembly of components, firms increasingly avoided the practice of producing a whole car from raw materials since a great

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began production in 1912 by which time there was a large number of component firms.

[15] D. Thoms and T.Donnelly, *The Motor Car Industry in Coventry since the 1890s*,(1985), p. 63.

Table 7.2
The Output of Vehicles in Britain 1908-1913

Year	Total Number of Vehicles
1908	10,500
1909	11,000
1910	14,000
1911	19,000
1912	23,200
1913	34,000

Source: PEP Engineering Report, Motor Vehicles, 1950 p. 10

deal of capital was tied up in component stock. Consequently, along with an increase in the number of car component firms there occurred an increase in the import of foreign car components. Table 7.3 shows that whilst the import of cars fell between 1907-1909, the purchase of foreign car components increased.

Table 7.3
Figures Issued by the Board of Trade: Value of Import of Cars and Components 1907-1909 (£'s).

Year	Cars	Components	Total
1907	1,675,224	1,935,602	3,610,826
1908	1,203,708	2,152,446	3,356,154
1909	900,626	2,346,136	3,246,762

*Source: **The Times**, 17 November 1909, p. 8.*

In 1908, *The Times* remarked that although the import of components showed an increase it was 'directly due to the British assembling of parts into cars, which cars when finished pose as British-made. Although not very flattering, nevertheless it is more satisfactory than importing whole cars'.[16] The constantly changing design of cars and the unstable market conditions of the Edwardian period caused immense problems

[16] *The Times*, 17 November 1909, p. 8.

for car producers which further encouraged firms to experiment with external economies.[17] In 1901, Daimler reported that over £48,000 of their capital was tied up in stock which 'consisted almost entirely of finished parts'.[18] Indeed, by 1908, Damiler was fitting complete electrical lighting sets to their cars which had been wholly purchased from outside suppliers.[19]

The car makers' decision to purchase or make components seems to have been determined by the type of product required. Components which did not demand large research and development costs continued to be produced by the car manufacturer. For example in 1912, Standard Motor Company still found it more economic to produce its own hood and side screen despite receiving a tender from the Rotax Hood and Sidescreen Company. Mr Budge, the manager, found their quote of £10/10 per set 'unfavourable' since he calculated that after fitting costs, the total of Rotax's estimate per set, was £3 more than Standard's price for the same article.[20] However, from 1908 onwards, some of the most frequently bought out components were engines (and engine components), electrical equipment, bodies, wheels and tyres. Significantly, all of these products required fairly high research and development costs, a burden the car assemblers were keen to pass on. The change in

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[17] W. Lewchuk, 'The Return to Capital in the British Motor Vehicle Industry 1896-1939, *Business History*, 27, (1985), p. 21.
[18] CRO, Acc 606, Daffern and Stephenson, Daimler Balance sheet 1901.
[19] *Coventry Standard*, 4 January 1952, p.4.
[20] MRC, MSS 226/ST/1/2/1 Standard Motor Company Minute Book, 2 July 1912.

production policy is captured by the fortunes of the Deasy Motor Company. Formed in 1906, the concern bought the former Iden Motor Company factory in Parkside and invested over £700 on new body department. The intentions of Captain Deasy were clear, when in the same year he announced that:

> A separate department for the manufacture of bodies is being established. This will enable the company to deliver cars complete in every way, thus saving much time to customers and expense to the company.[21]

Captain Deasy's optimism was not well founded as after the 1906 Olympian Motor Show only eleven cars were sold. It was also reported that the eleven cars had developed serious faults, the most serious of which were defective breaks and a weak back axle.[22] Clearly, Deasy did not possess the expertise, and the research and development capital required successfully to produce a whole car. The change in production strategy was recorded by a former Deasy Motor Company employee who remembered that in 1909:

> the works were producing not only every portion of the car, but the carriage bodies as well. Naturally, it took some time to thoroughly investigate the position before we could grasp the advantages of this system...we decided to discontinue the production of carriage bodies as a very heavy loss had undoubtedly taken place in this department...[23]

While bodies represented the most expensive component to produce, the research and testing of engines also proved

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[21] CRO, Acc 1060/1/1/1-4, Deasy Minute Book 1906-1910, 28 May 1906.
[22] CRO, Acc 1060/1/1/1-4 Deasy MB 1906-1910, 1 December 1906.
[23] CRO, Acc 1060/1/1/1-4, Deasy Minute Book 1906-1910, 20 June 1910, Armstrong Siddeley Motors, *The Evening and the Morning*, 1956, 21.

extremely costly. By 1910, Deasy was assembling a large proportion of the car by purchasing the body and chassis from Rover and the engines from White and Poppe and Daimler.[24] Likewise, research and development costs into the early carburettor were also particularly high. During 1909-1910, after Standard's own carburettor failed, the firm abandoned experimentation into this area by purchasing no less than seven different units in a bid to find a reliable and low-cost carburettor.[25] By 1914, it had become clear that the component industry was an integral sector of the motor industry since Standard, Deasy and Rover were purchasing engines, bodies, electrical equipment, wheels and tyres from outside suppliers.[26]

The assembler who transferred research and development costs to component makers also benefited from relatively low switching costs. Despite increasing car production, assemblers continued to order small runs of components from specialist producers to enable them to switch to more competitive rivals should they emerge. Moreover, some branches of the component trade, such as electrical equipment, had only just progressed from the experimental stage of manufacture. Consequently, by employing the strategy of ordering short runs of components, the assembler was protected from purchasing large quantities of

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[24] CRO, Acc 1060/1/1/1-4, Deasy MB 1906-1910, 20 June 1910.
[25] MRC, MSS 226/ST/1/2/1 Standard MB, 5 January, 2 February, 6 April, 11 May, 21 September, 19 October 1909, 6 July, 25 August 1910.
[26] CRO, Acc 1060/1/1/1-4, Deasy MB 1906-1910, 15 March 1907, 20 June 1910, MRC, MSS 226/RO/1/1/3, Rover Minute Book 1909-1917, 21 March 1910.

faulty stock.[27] Standard, a company which perhaps most relied on bought out components, learned this lesson from bitter experience after they ordered large sets of steering components in 1909. The board minutes record that the production of the Standard's 4 Cylinder car was severely delayed due to:

> Messrs Baker being behind with the steering parts. The order being given to them was condemned, especially after our previous experiences. Messrs Dover making a mistake with the steering wheels was also brought before the Board - another detail which threw us back.[28]

From this point onwards, Standard was careful not to commit itself to one supplier. For example, between 1909-1912, the Standard Motor Company, in a bid to purchase cheap and reliable magnetos, ordered short runs of components from Hirst Magneto, Bosch (on two separate occasions), Simms Magneto, DU Magneto, and Elseman Magnetos.[29] Low switching costs also enabled assemblers to purchase supplies from rival component companies at very short notice, a strategy which could be financially costly for suppliers. In 1907, Johnston, Hurley and Martin was left with fifteen unwanted engines worth over £1,200 after a customer switched suppliers. A more serious loss was incurred by White and Poppe, which in 1914, was left with

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[27] For a short period, Rover started making some of its components again after receiving faulty supplies of small fittings, see MRC, MSS 226/RO/1/1/2, 29 January 1907.
[28] MRC, MSS 266/ST/1/2/1 Standard MB, 23 February 1909.
[29] MRC, MSS 266/ST/1/2/1 Standard MB, 5 January, 6 April, 13 July, 10 October 1909, 11 October 1910, 10 October 1911, 18 June 1912.

£15,000 worth of engines after Morris decided to import cheaper American engines.[30]

The assembler's policy of ordering short runs of components from different suppliers helped shape the structure of the Coventry motor industry in two major areas. First, the number of component firms increased between 1908-1914, aided by the fact that the assemblers' demand for only small runs of supplies meant entry barriers for component firms were relatively low.[31] Second, with the increase in small scale firms, the assemblers were able to take a powerful position in the buyer and supplier relationship.[32] The car producers' determination to transfer their production costs to component suppliers was assisted also by the early structure and development of Coventry's economy. Many suppliers were small units of production which had diversified into the motor industry after suffering from the depression in the cycle industry. Thus by 1905, with the rapid decline of the cycle industry, car assemblers held the upper hand in negotiating price, delivery and payment arrangements, a situation which was to continue through the interwar period.

Perhaps the critical advantage that car manufacturers drew from their relationship with suppliers, was their demand that component suppliers offer substantial credit after purchasing materials. While this practice, which had become an established

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30 LBA, B379a/18, 24 March 1909, B379a/21, 17 October 1914.
31 See chapter three.
32 M. Porter, *Competitive Strategy. Techniques for Analyzing Industries and Competitors*, (New York, 1980), p. 6, 10.

custom by 1914, saved some car manufacturers from almost certain extinction, it bought many component suppliers to the brink of bankruptcy. Indeed, it was during this period that mis-trust grew between assemblers and component makers which stemmed directly from this 'established custom'. In 1903, F.H. Ragg, the Coventry Lloyds Bank manager, warned E.J. Hardy, a newcomer to the car component industry, 'to be careful and not to trust the motor companies or get too much on his books.'[33] However, despite its relatively small size, competition within the Coventry component industry was fierce, and consequently even fairly large concerns were obliged to offer generous contracts and credit terms to car producers. Even White and Poppe, which was the largest engine and carburettor producers in Coventry found it imperative to grant credit in order to acquire contracts. At an early stage in the development motor industry, White and Poppe attempted to reduce the amount of credit offered to their customers. When in 1906 Singer requested £17,000 worth of engines, White and Poppe demanded that Singer pay a deposit of £3,000 and accept the order on a weekly basis. White was reluctant to accept such a large contract without any guarantees and claimed that he 'could not afford to run any risk, as if the deliveries were not taken it would lock up so much money in aluminium and brass'. White and Poppe's bid to limit credit failed since Singer immediately

[33] LBA, B379a/13, 29 May 1903.

reduced their orders from £17,000 to £3,000.[34] Thus in 1912, White and Poppe had little option but to grant Singer interest credit on goods worth more than £8,000 after the firm fell ten weeks behind in its weekly payments. Consequently, despite a full order book, White and Poppe requested constantly extended limits to their overdraft since their capital was tied up in stock and credit. The cash flow problems were so severe that White and Poppe was only saved from bankruptcy after large orders for munitions work were placed.[35] Another smaller engine firm, Cromwell Engineering, not only felt obliged to offer good credit terms but also manufactured products 'when required'. Once again F.H. Ragg highlighted the firm's predicament in the Lloyds daily journals when he noted that:

> The Rex owe £20 supplied in January for special pumps suitable only to themselves, and they have a similar order nearly finished. On the contract it was stated 'for delivery when required', and they are obliged to stand out of money, as the Rex are very quiet.[36]

The problems of granting credit and the accumulation of stock were not unique to the engine producers but applied throughout the component industry. In 1912, Charlesworth Bodies was forced to borrow from its bank after Singer delayed cash payments.[37] Charlesworth's financial situation was not helped by the great variation of bodies that manufacturers demanded. For example, in 1908 Charlesworth, which by this time was

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[34] LBA, B379a/15, 30 November 1906.
[35] Thoms and Donnelly, *The Motor Car Industry*, 72-73
[36] LBA, B379a/17, 11 June 1908.
[37] Thoms and Donnelly, *The Motor Car Industry*, 51.

supplying Riley, Rover, and Singer, exhibited twenty different bodies at the Olympian Motor Show.[38]

Another strategy which car manufacturers employed to delay cash transactions was the payment of credit bills, a system which was deeply unpopular among component makers. The car manufacturers' policy of paying bills became particularly common during times of recession in the motor industry. During the motor industry recession of 1907-1908, Doherty Motor Accessories refused a contract with Rover despite trade being 'very quiet' as Rover would only pay in £300 bills. Doherty, which with capital of only £450, was constantly short of working capital, declared to Rover that it 'would be better off without it'.[39] However, in many cases car producers altered payment arrangements after contracts had been agreed. The Lloyds Bank Manager of Coventry reported that, in November 1910, Rover's cash flow problems had rebounded on Doherty: 'Mr Fenton [the works manager] says that the Rover Company are pressing him to take bills for his monthly account from now to February, when they will resume cash payments again.'[40] In 1908 the engine makers, Johnston Hurley and Martin found itself in a similar situation with the Calthorpe Motor Company of Birmingham which it was 'heavily reliant on'. By paying in the form of bills, Calthorpe avoided the regular cash payments of £260 that had been agreed upon, and in effect enjoyed long periods of interest

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[38] *Autocar*, 31 October 1908.
[39] LBA, B379a/17, 18 December 1908.
[40] LBA, B379/19, 28 November 1910.

free credit. A furious Hurley stated that he 'would never accept another bill' and that 'he would not be dictated to' by Clathorpe. However, Hurley continued to accept payment by bills and Calthorpe continued to break payment agreements at will.[41]

The firm which suffered most at the hands of the car manufacturers' credit arrangements was the electrical components producer Van Raden. By 1902, Van Raden had acquired contracts with Daimler, the Motor Manufacturer Company and Wolseley by offering generous credit terms. A concerned bank manger from Lloyds reported in his journal that 'he [Van Raden] was getting too much on his books, but he says that it is good. He is obliged to give credit or he loses orders'.[42] This method of attracting business caused firms like Van Raden, which was in a competitive branch of the component trade, acute financial problems. Van Raden's rivals in the electrical sector included Lucas of Birmingham, Smith and Sons, Hirst Magnetos, both of London and Bosch of Germany. Thus, with this intense competition, Van Raden was forced into increasing the generosity of his credit terms. By 1908, Van Raden was providing £1,000 worth of interest free credit to car manufacturers and consequently extended its bank overdraft to £1,500 to pay for its own debts.[43] In the same year, Lloyds bank refused Van Raden any further extensions to their limit and warned the owner, Vaughan Robinson, that unless the concern

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[41] LBA, B379a/17, 12 December 1908.
[42] LBA, B 379a/12, 8 September 1902.
[43] LBA, B 379a/17 21 August 1908.

could retrieve their outstanding payments, then financing the firm would be like 'putting water down a drain'. Indeed, the bank manager told Robinson in no uncertain terms that he had 'never seen such losses...and if it was not for the old connection I should demand the overdraft'.[44] By 1912, the same bank manager, was recommending that Robinson wind up the business since it was 'not likely to go on beyond twelve months'.[45] In fact, Van Raden survived under the control of the Robinson family until 1918 when it was sold, complete with large sets of outdated stock, to Rankin and Starley, two men in the battery business from London.[46]

The dominance that car manufacturers exerted over component firms did not stop at the fiscal advantages gained from contracts. By 1914, the links between some manufacturers and component firms became extremely close. Although vertical integration was not a common occurrence before the First World War, a few significant car producers took over component firms in order to guarantee supplies. In 1907, Rover purchased its body supplier Hawkins and Peake for £600. Rover asserted that the purchase would in the short term 'protect the supply of car bodies' and in the long term the firm predicted that 'great savings can be effected'.[47] The same objectives lay behind Deasy's purchase of the London based Burlington Carriage

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[44] Ibid, 27 January 1908.
[45] LBA, B 379a/20, 27 December 1912.
[46] Taped interview with Mr Eric Starley, 2 October 1992.
[47] MRC, MSS 226/RO/1/1/2, Rover Minute Book 22 November 1906 and 29 January 1907.

Company in 1912. Prior to this transaction, Deasy's bodies had been supplied by Rover, and consequently, Deasy was keen to place less reliance on a major competitor for the supply of coach work.[48] The personal friendship between Percy Martin of Daimler and Alick Hill of Coventry Chain may have influenced the close relationship between these two firms. Daimler, which had been Coventry Chain's largest customer, invested £30,000 in its chain and nut and bolt suppliers after Chain was financially reconstructed in 1907. In effect, Daimler had acquired a considerable degree of control over its suppliers since part of the deal allowed Daimler to appoint two directors on Coventry Chain's Board.[49]

Besides lowering the cost of components and protecting supplies, car manufacturers often invested in component makers to guarantee quantity levels. From 1907, Daimler steadily increased its investment in Albion Drop Forging to enable the supplier to increase their output.[50] By 1912, Albion had been awarded Daimler's entire drop forging work worth between £20,000 and £30,000 per year. However, Albion had to rely on a loan from Daimler of £6,000 to finance the £10,000 worth of buildings and plant required to fulfil the contract.[51] Despite the 100 per cent profit on ordinary capital Albion enjoyed in 1912,

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[48] CRO, 1060/1/1-4, Siddeley-Deasy MB, 30 June 1913.
[49] Midland Bank Archive (hereafter MBA), 358/5, 18 April 1907.
[50] LBA, B379a/16, 6 February 1907.
[51] LBA, B 379a/20 2 June 1912.

the Lloyds bank manager warned of the dangers of placing too much reliance on one car firm:

> At the present time the Daimler take about half their output and this will make three quarters. There is a demand for similar goods from other firms. I told him [Mr Haynes, the chairman] it was a large account to do with one firm.[52]

However, with the financial leverage that Daimler now held in the firm, it is doubtful whether Albion had any realistic alternative other than to comply with Daimler's increasing production demands.

Despite the temptations of component firms to accept external finance, that would boost their order books, most suppliers prior to the First World War attempted to maintain a degree of independence. As early as 1902, Doherty reported to the bank manager that it had resisted a take-over bid by an anonymous concern in the motor industry.[53] In 1906, Van Raden eventually turned down a joint offer by two of its largest customers, Wolseley and Argyle of investing £10,000 in the firm. Although this would have increased the concern's capital to £20,000, the bank manager warned them that it 'Practically meant giving the two companies named the power, and that would not do any good. It is a good business if they will work within their capital'.[54] Another firm keen to protect its independence was White and Poppe. Although it continually suffered from a

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[52] Ibid, 16 September 1912.
[53] LBA, B 379a/12, 9 November 1902.
[54] LBA, B 379a/ 15, 30 June 1906.

shortage of capital due to the enforced credit arrangements, in 1909, White and Poppe turned down an offer from the Deasy Motor Company of £10,000 worth of capital in ordinary shares. White and Poppe could not agree to Deasy's demand of a 10 per cent reduction in engine prices and a request to be given preferential treatment in production and delivery.[55] The vulnerable position of component firms to take-over bids by car manufacturers is demonstrated by the fortunes of Johnston, Hurley and Martin (JHM). In 1910, JHM's largest customer, Calthorpe Motors, attempted to take-over the firm by methods which the Lloyds bank manger described as a 'shabby trick'.[56] Mr Hands of Calthorpe, who was a debenture holder in JHM, let his monthly interest accumulate and then, during a period in which Calthorpe had delayed payment of its monthly account, Hands put in a claim for his debenture interest. A concerned Hurley reported to his bank that:

> they would have been a good deal better without the Calthorpe Company and that Hands, the solicitor and the auditor leagued together, thinking that they could not pay the debenture, and the concern would be in Hands' power at his own price...[57]

This failed take-over bid ensured that JHM became extremely cautious in its dealings with Calthorpe, only supplying the firm

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[55] LBA, B 379a/18, 6 December 1909.
[56] LBA, B 379a/19, 29 September 1910.
[57] Ibid, 11 October 1910.

with one engine per week and never allowing more credit than a £150 per month to accumulate.[58]

Thus the component firms' interaction with car producers was more complex than a conventional buyer and seller relationship. However, between 1895-1914, it is clear that the car assemblers emerged as the dominant force in their relationship with component firms. The business practices forged by car assemblers during this formative period of the motor industry had become 'established custom' by 1914. Not only did the car manufacturer use the specialist producer to acquire parts which they found difficult to make, but also used the component sector to pass on production costs and obtain interest free credit. The car component firm's important role in providing financial assistance to car manufacturers explains why there was little in the way of vertical integration in the motor industry up to 1914.[59]

Vertical Dis-integration and the Importance of the Domestic Car Market, 1918-1939.

During the interwar period the British motor industry made enormous gains in the production of cars for the domestic market. In the late 1920s over 75 per cent of car production was dominated by Austin, Morris and Singer. By the 1930s, these three companies had been joined by Vauxhall, Rootes and

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[58] Ibid, 29 May 1911. See also chapter 4 on the sources of finances of firms.

[59] G. Maxcy, 'The Motor Industry', in P.L. Cook (ed), *Effects of Mergers*, (1958), p. 353.

Standard who became volume producers.[60] However, these achievements had only occurred after the major assemblers altered their relationship with suppliers and began ordering a greater variety of components from external sources. Church has noted that this strategy:

> allowed not only the big spenders, Ford and Vauxhall, to join Morris and Austin as leaders, but also Standard and Rootes, firms whose modest resources yet attractive designs enabled these companies to establish themselves as serious competitors among the Big Six.

Indeed, during the early 1930s it was estimated that as much as 80 per cent of the average vehicle comprised of bought out components.[61] Clearly, by 1939, volume production had become associated with the utilisation of the component sector. This trend was recognised by *Automobile Engineer* which stated that 'in modern manufacture the tendency is for the supply of certain components to pass more and more into the hands of specialists'.[62] However, although the motor industry made some impressive strides, the initial push towards volume production after the First World War ended in failure. Indeed, it took a restructuring of the motor industry, from the myriad of small firms towards a concentration of major car producers to achieve volume production.[63] The following section will examine how

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[60] Thoms and Donnelly, *The Motor Car Industry*, p. 84.
[61] R. Church, *Herbert Austin. The British Motor Car Industry to 1941*, (1979), p. 135. Langlois and Robertson, 'Explaining Vertical Integration', p. 368.
[62] *Automobile Engineer*, May 1939, p. 158.
[63] For a detailed discussion of the re-structuring of the car industry see Thoms and Donnelly, *The Motor Industry*, ch 4.

the re-structuring of the industry affected the relationship between car assemblers and component suppliers in Coventry which had been established prior to the First World War.

The British motor industry during the 1920s and 1930s was unquestionably dominated by company mergers and take-overs. However unlike the US, this period did not witness widespread backward integration by car assemblers. Nevertheless there were some notable exceptions. In 1919, White and Poppe practically left the car component industry after the concern was bought by the commercial vehicle builders Dennis Brothers of Guilford. Consequently, the firm concentrated on producing commercial vehicle engines until Dennis transferred the business to the south east in 1935.[64] In 1923, Morris acquired Hollick and Pratt the coach builders, which became a centre designated for the production of specialist body work, and the Coventry engine makers Hotchkiss and Cie. Similarly, in the same year, Morris effectively took control over Doherty Motor Components after persuading the radiator producer to open a factory closer to his Cowley plant.[65] Rover, another important car concern, also integrated backwards in the production line during this period. Rover, which had already purchased Midland Light Bodies (formerly Hawkins and Peake) in 1907, took over the Nero Engine Company in 1916, with the view of expanding

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[64] Surrey Record Office, 1463/2/3 Dennis Brother Minute Book 1913-1920, pp. 252-254, 1463/2/5 MB. 1931-1943, pp.132-133.

[65] R.J. Overy, *William Morris, Viscount Nuffield*, 1976, pp. 19,26.

their productive capacity to manufacture a small car.[66] However, contrary to Chandler's assumptions,[67] the purchase of a component firm did not necessarily guarantee supplies as Daimler discovered to its cost. Daimler, who held substantial shares in the body firm Fairy and Charles, were forced to intervene and re-organise production after the coach firm ran into severe financial difficulties which led to its eventual closure in 1921. Due to its financial commitment, Daimler was unable simply to switch suppliers and subsequently took control of production by removing the indigenous management and replacing him with Mr Cammack, a Daimler employee. The cost to Daimler of re-organising production and keeping the works open to finish its order was approximately £50,000 over the original price agreed for the bodies.[68]

The relatively few cases of backward integration or even heavy investment by assemblers into suppliers was due to two main factors. First, the financial weakness of many assemblers, such as Rover, Singer, and Standard, meant assemblers were anxious to continue to take full advantage of the low switching costs and generous credit arrangements that were extracted from the small component firms. Second, and by far the over-riding factor, was that the assemblers' use of the component sector was the optimum production strategy with regards to competing in the domestic car market. Thus in analysing the reasons why

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[66] MRC, MSS 226/RO/1/1/3, Rover MB 1909-1917, 21 August 1916.
[67] A. Chandler, *Strategy and Structure*, (Cambridge, 1962), p. 116.
[68] CRO, 594/143 Daimler Archive, Fairy and Charles file, 31 March 1921.

British car assemblers' production strategy was so radically different to their American counterparts, this section will first explore the continued fiscal advantages of utilising the component sector and second will examine the importance of the British car market in determining the car assemblers' production strategy.

The configuration of the motor industry during the 1920s and 1930s ensured that most car assemblers retained their powerful position with their small suppliers. In Coventry, where small component firms continued to numerically dominate the industry, this was particularly noticeable. The Coventry motor industry had mirrored the national trend during the 1920s by experiencing a large number of entrants and exits in both car assembling and, to a lesser extent, car component firms. Although, in 1931 there were eleven car producers in Coventry, forty had entered and left the trade since 1918. Similarly, the number of car component firms had dropped from seventy four in 1919 to sixty four by 1936.[69]

The increase in small component firms during the 1920s and 1930s and the continuation of low switching costs were exploited to the full by both large and small car assemblers alike. Thus despite the emergence of large component firms such as Dunlop, Lucas, and Smith's Motor Accessories, car assemblers continued to receive supplies from small component makers. Despite the advantages that large component suppliers

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[69] Thoms and Donnelly, *The Motor Car Industry*, p. 85.

could offer, such as a rapid production of long runs of components, many assemblers were more concerned with securing the cheapest components on the market, and receiving generous credit terms from their suppliers. Moreover, if a car assembler was experiencing financial difficulties, not only did large component firms turn down requests for credit, but they could also afford to refuse its business altogether. Component firms working with very small capital could not afford the luxury of turning down business, despite the risks involved. For example, Coventry Motor Panels, with capital of just under £1,000 made a substantial loss of over £3,500 when Swift went out of business in 1931. The Midland Bank manager in 1932 noted that:

> They [Motor Panels] are making arrangements for the capital to be increased. Last year was disastrous. The Swift Company let them in for £1,300 and they suffered severe competition from Sun Ray Metal Pressings...[70]

During the 1920s, a similar loss was experienced by Pistons Ltd which had a capital of only £500. Gordon Parsons, the son of the company founder, recalled that 'in the 1920s we were doing pistons for Bellsize Motors in Manchester...they went bust and my father got a Bellsize car in lieu of debt...we were all happy because we could go out in it'. This situation did not alter dramatically for Pistons during the 1930s as, Gordon Parsons remembered that 'when Lea Francis was in financial trouble the

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[70] MBA, 358/7, 20 January 1932.

main suppliers would not supply them so they came to us.'[71] Indeed, for many firms, the use of small component firms out weighed the advantages gained by large suppliers as they could retain their bargaining power, which was reduced with larger component firms. Assemblers, would often approach small component firms with the offer of large contracts, that required the supplier to purchase more plant. Once committed, the assembler would then demand that the cost of the components be reduced. Indeed, during the interwar period, Pistons Ltd were extremely cautious with their dealings with assemblers. Gordon Parsons noted that his father, Harry, made a conscious effort to avoid over-committing the company to one assembler:

> We had seen what had happened to some of them [the suppliers]...people who had dealt with some of the car companies, they were worried to death about getting paid. Standard Motor Company was notorious in Coventry for being a bad payer...they put a lot of work out in Coventry. I remember one firm named Wilkinson, they used to do a lot of work for Ford...he made gears...he got taken for a ride by Fords they wanted thousands and thousands of gears and he put in plant to make them and they kept saying that he had to get his price down and so he'd knock a bit off and so eventually he was working at a loss.[72]

In some cases even larger supply firms were persuaded to commit almost its entire production to one car assembler. A Coventry car firm which diligently followed this strategy was the Standard Motor Company. Standard, which was one of the first car concerns to purchase large quantities of components,

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[71] Taped interview with Gordon Parsons, formerly owner of Pistons Ltd, 16 October 1992.
[72] Taped interview with Gordon Parsons, 16 October 1992.

increased its reliance on the supply sector during the interwar period. Moreover, by the early 1930s, Standard had moved into a purpose built factory in Canley, Coventry which was designed to accommodate the influx of components from external sources. In 1933, a journalist, after visiting the new factory, noted that it was designed 'principally for the assembly process, and had incorporated 'unique' production line techniques. He concluded by describing the process in which components purchased from suppliers entered the factory and how stock levels were constantly monitored:

> supplies arriving at the works are charted in the stores department, a horizontally moving red line indicating arrival, whilst a moveable vertical indicator records the consumption. In this way an hourly check on the position of all supplies is maintained. When the consumption indicator approaches within a figure of the incoming supply figure danger signals are posted in the appropriate columns whilst the executives concerned are warned.[73]

Another consequence of this production policy was that, independent component firms began to site factories within close proximity of Standard's Canley premises. In 1937, the body manufacturer Fisher and Ludlow agreed to site a factory next to Standard and work closely with the assembler over production techniques and totals. However, as the Standard board minutes revealed, this commitment by Fisher and Ludlow ensured that the body maker incurred a heavy capital outlay.

> they [Fisher and Ludlow] also have the confidence and courage to come to Canley to construct a factory at very

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[73] *Automobile Engineer*, February 1933, p. 45.

> considerable capital expenditure on their part, and building operations have already commenced. We are collaborating with them in the construction and plant for this factory, and it will be laid out and equipped only as a modern production unit should be.[74]

Thus, while the structure of the motor industry remained as it was, this arrangement proved extremely beneficial for Standard, which, without having to make an investment, had on its door step a modern well equipped body factory.

Component firms which, on the other hand, had not committed production to one assembler, were constantly at risk to assemblers switching suppliers if orders were delayed. The risks for body makers were particularly high, since the assembler often demanded that the supplier incur the re-tooling costs. The re-tooling costs were high as assemblers, during the 1930s, were constantly making many different versions of the same vehicle in a bid to capture a greater share of the market. In 1933, the Midland Bank inquired why Coventry Motor and Sundries had sustained a loss despite good business. The bank manager reported that:

> Mr Grindlay says the loss shown is due to the cost of jigs and tools for new motor bodies, which during the last 18 months have cost £3,000...they are very busy.[75]

Similarly, the BSA group would only offer Coventry Motor Panels a contract to produce bodies for Daimler and Lanchester if the supply firm purchased £1,200 worth of equipment.[76]

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[74] MRC, MSS 226 ST/1/3/1 Standard Board Minutes 1923-1970, 10 November 1937.
[75] MBA, 358/13, 17 October 1933.
[76] MBA, 358/7, 20 June 1934.

Moreover, the installation of new tools usually lasted between six to twelve months, a period in which body firms were forced to reduce productive capacity.[77]

This strategy of increasing the use of component suppliers and reducing in-house production costs, was adopted by almost all car assemblers during the interwar period. For example Austin, which had always promoted the practice of in-house production, was spending more than £60,000 a year on subcontracting for bodywork. Indeed, by 1931, 55 per cent of the net sales value of Austin's output was derived from outside sources.[78] Even Daimler, a concern notorious for making many of its own components, began increasing its intake of external components in a bid to reduce overhead costs and stocks by £400,000 during the late 1920s and early 1930s. It was during this period that Daimler suffered a loss in its market share of the £1,000 range of cars to Rolls Royce and Bentley, and the £300-£500 market which Morris had cut into.[79] Consequently, between 1928-1932, Daimler reduced its Coventry body shop from over 120,000 square feet to 57,000 square feet. By the early 1930s Daimler was supplied by over twenty five body firms, five of which were based in Coventry.[80] This policy brought the car firm considerable reductions in production costs, however, the few bodies still built by Daimler were proving uneconomic. A

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[77] *Automobile Engineer*, July 1934, p. 273.
[78] Church, *Herbert Austin*, p. 135.
[79] CRO, ACC 594/70, Daimler Car Policy 1936.
[80] CRO, ACC 594/70 Daimler factory 1928-1932, ACC 594/143 Daimler coach suppliers 1930-1935.

report by the managing director on car policy in 1935 confirmed the belief that:

> our general costs of bought out materials for the chassis. whether raw or finished, are on a reasonably economic level. On the other hand the body costs, the chassis production wages and the total overheads are excessive beyond the premium that the Daimler and Lanchester cars can command.[81]

A small car assembler which also pursued the practice of purchasing components during the interwar period was Alvis. Despite experiencing severe problems with suppliers, Alvis, which was formed in 1919, did not attempt to secure supplies by purchasing a component maker during the 1920s and 1930s. By 1925, the chairman reported that the shortage of coach work and the poor quality of the bodies received was having a 'serious effect upon the company's business'.[82] Although some pressure was placed on the board to purchase its own body shop from the firm's founder, T.G. John, the board concluded that despite its draw backs, the outside suppliers proved more economic. Indeed, between 1926-1928, low switching costs enabled Alvis to use three different body builders in a bid to acquire cheap and good quality bodies.[83] However, the over-riding factor preventing a takeover, was the initial outlay required, the lack of any credit facility which would have been extracted from suppliers, and the high cost of production. In 1932, this matter was once again discussed by the board. While T.G. John

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[81] CRO, ACC 985/70 Daimler Report on Car Policy, 9 November 1935.
[82] CRO, ACC 985/1/1 Alvis Minute Book 1925-1934, 23 June 1925.
[83] Ibid, 18 March 1926, 2 February 1928.

continued to recommend that Alvis acquire one of the Coventry body firms which had just gone out of business, the board pointed out that a much larger output would be required to cover the £15,000 to £20,000 necessary to purchase a concern. Moreover, the managing director 'thought that the company was buying coachwork at competitive prices and that the people who were making the bodies were not making a profit'. Consequently, much to John's disappointment, the firm continued to purchase from outside suppliers.[84] The problems encountered by Daimler and Alvis does not only provide an insight into an assembler's (large and small) decision of whether to make or buy, but also highlights the extremely difficult circumstances that component firms were working under during the 1920s.

Clearly, this period of transition caused immense problems for component firms since they had to balance the needs of a small, and possibly bankrupt, car firm with the requirements of the larger car assembler bidding to enter into volume production. The difficulties for component suppliers during this period were encapsulated by the activities of Smith's Stamping Company. Like many component firms, Smith's believed that the 1920s heralded a great new era for the British motor industry. In an effort to attract more motor car custom, the firm published a brochure that was circulated around the motor industry, and for the first time, secured a stand at the London Motor Show of

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[84] Ibid, 18 November 1930, 20 January 1932.

1921.[85] Although Smith's had already secured a large order for 600 sets of components per week from Morris, the stamping firm wanted to avoid becoming merely a Morris subsidiary. This strategy met with some success when, in 1921, Smith's won a large order for car forgings from the Ford Motor Company.[86] However, these contracts ensured that Smith's placed a great deal of commitment in the motor industry, and consequently, during the 1920s, rushed head long into contracts with smaller and less stable firms. Between 1921-1929, Smith's received regular orders from a number of small concerns such as Commer Cars, Vulcan Motor Company, Alvis, AC Cars, Bellsize Motors, and Calcott Brothers. Significantly, only Alvis survived as an independent company after the interwar period.[87] While Smith's wanted to avoid becoming over-committed to large concerns such as Ford and Morris, the firm faced more serious problems with the smaller car firms' constant inability to pay for goods received. Throughout this period all of these small car firms enjoyed generous credit terms ranging from £1,000 to £2,000 from Smith's.[88] This drain on Smith's capital was compounded by the reluctance of larger car assemblers to pay their account at the agreed time. For example, in March 1928, despite several deputations by Smith's to Standard, the car firm had still not

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[85] A. Muir, *75 Years of Progress*, 1958, p. 56.
[86] CRO, ACC 634 Smiths's Stamping Minute Book 1903-1918, 30 November 1921, 28 May 1924.
[87] J. Wood, *Wheels of Misfortune. The Rise and Fall of the British Motor Industry*, 1988, pp. 71,124.
[88] For a typical example see CRO, ACC 634, Smith's Stamping Minute Book, 28 February 1925.

paid for goods worth almost £1,500 received in November.[89] Inevitably, Smith's post war optimism began to fade rapidly with the onset of the 1921-1922 recession. As early as 1921, Vulcan appealed to Smith's for extended credit on supplies already received as the bank 'had definitely stopped further credit allowances'. Smith's, realising that it would stand to lose the whole account if it refused, agreed, on the condition that Vulcan increase its orders to 75 per cent of its total requirements.[90] Although, this may seem a rather reckless request to a firm in severe financial trouble, it does show the extent of Smith's commitment to the small vehicle assembler. However, conversely, once car firms had opened accounts with the stamping firm, Smith's was reluctant to cease supplying parts to the customer or to refuse credit arrangements as it would have forced small firms out of business, a scenario in which Smith's stood to lose everything. The small car firm's practice of regularly changing car design to stamp some individuality on to the model, also put pressure on smaller component firms such as Smiths. In some instances, assemblers refused to pay for goods that were no longer required for the new model which had been ordered and delivered on time. For example in 1925, the Calcott Company, in a desperate attempt to increase their share of the light car market, introduced a new high-powered model. However, in the same year, Calcott experienced a net loss of

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[89] CRO, Acc 634 Smith's Stamping MB 1918-1927, 28 March 1928.
[90] CRO, ACC 634 Smith's Stamping MB 1918-1927, 9 June 1921, 15 September 1921.

£26,000 and consequently, at first, refused to accept Smith's delivery for components designed for the older model. The Smith's company minutes noted that the Calcott Company:

> were experiencing considerable difficulty and a great part of the material owing for was practically obsolete due to a change of car type and the delivery had been taken under pressure. Mr Godfrey [Smith's manager] had arranged with Mr Calcott to take two saloon cars in contra account at a net price of £425 each...the question of further payment would be raised.[91]

Unfortunately, Smith's never received the remainder of the bill as shortly after this meeting, Calcotts entered into liquidation and was eventually taken over by Singer in 1926.[92]

Thus far, the evidence has revealed that the relationship between car assemblers and component makers remained similar to the pre-war arrangements. This assertion is further supported once the credit arrangements are examined during the interwar period. For example, despite Coventry Motor and Sundries receiving 'some very good contracts' from BSA, Humber, Hillman, Riley, and Morris, the Midland bank manager reported in June 1933 that the:

> temporary excess shown is due to the fact that several of their customers are backward in paying...at present they owe over £4,600 due to them [Coventry Motor and Sundries] at the end of May.[93]

A more serious debt was experienced by Coventry Motor Fittings, which, in 1935, was owed over £13,000 by Standard.

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[91] CRO, ACC 634 Smith's Stamping MB 1918-1827, 15 November 1925.
[92] Thoms and Donnelly, *The Motor Car Industry*, pp. 89-90.
[93] MBA, 358/13, 27 June 1933.

The Midland Bank reported that, although Coventry Motor Fittings' business 'was increasing', they had only secured a contract with Standard by allowing the car assembler to regularly take two months credit on their purchases, which amounted to over £5,000 a month. Such was the scale of this credit, that it consumed almost all of Coventry Motor Fittings' bank overdraft.[94] Similarly, Carbodies, which by the 1930s had increased its productive capacity, also experienced similar problems with assemblers. In 1933 the local Midland Bank described Carbodies as:

> one of the most important motor body factories in the district whose output is almost exclusively taken up by Lanchester and Daimler. The factory occupies one of the best sites in Coventry...the buildings are new, equipped with modern machinery and covers 3 acres.

Due to this expansion, however, Carbodies was in a position to refuse orders from slow or bad debtors. In 1934, Robert Jones, the owner of the concern, was even prepared to accept a drop in sales after he refused several orders from the Riley Company because 'they were such bad payers'.[95]

Nevertheless, on the whole, the component firms' obligation to accept credit sales continued for small and large supply firms alike. For example, Cornercroft, a firm which despite enlarging its capital from £2,700 to £150,000 through public floatation during this period, did not succeed in reducing its credit sales.[96]

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[94] Ibid, 7 November 1935.
[95] MBA, 358/14, 16 August 1933, 5 October 1934.
[96] See chapter 4.

Table 7.4 shows that the sales between 1926 and 1937 for the months of March and May, the high season of the motor trade, were dominated by credit sales.

Table 7.4
Cornercroft Sales for the months of March and May 1926-1935.

Date	Credit Sales	Cash Sales	Total Sales	Credit Sales as a % of Total Sales
1926 May	1,121	296	1,417	72
1927 May	1,854	738	2592	72
1928 Mar	2,112	798	2910	73
1929 Mar	2,298	476	2774	82
1930 Mar	2,190	623	2813	79
1931 Mar	1,822	701	2523	72
1932 Mar	1,570	507	2077	76
1933 Mar	4,596	733	5329	86
1934 Mar	6,815	820	7635	89
1935*Mar	6,365	1,044	7409	86

Source:CRO, Acc 1468/1/1, Cornercroft Minute Book 1926-1936, Monthly balance sheets March and May
**1935-1936 Cornercroft became a public company*

Indeed, the table reveals that as sales increased the proportion of credit sales also rose from approximately 72 per cent in 1926 to 86 per cent in 1935. Moreover, the table also highlights the constant pressure exerted upon component makers for credit sales. The table represents sales figures for the spring and summer, months which were considered the high season for the motor trade. Consequently it was a period when car makers experienced severe cash flow problems prior to the sales season in the summer and autumn.

Alongside the fiscal advantages of continuing to make use of small component firms, such as the switching costs, the transfer of re-tooling costs and the extraction of generous credit terms, the car assemblers utilised the supply sector to comply with the demands of the British market. Indeed, at the heart of the debate of why British and American car firms adopted different production strategies was the nature of their respective domestic car markets. However, the significance of the British domestic car market has too often been overlooked. Thus Chandler explains the lack of backward integration in the British motor industry as a lack of managerial foresight which he alleges was characteristic of British industry throughout the period. Similarly, Lewchuck attributes Britain's production strategy, not to the peculiarity of its domestic market, but to the strength of labour bargaining on the shopfloor. Both of these accounts are not sufficient in explaining *why* there was low integration in the industry and instead they simply imply that British managers chose the wrong turn in their pursuit of mass production. An analysis of the British car market will shed light on the rational behind the car assemblers' decision to continue utilising the component sector.

As chapter six has confirmed, standardization within the British component industry was almost non-existent. This factor, combined with the high cost of raw materials ensured that British car components were on average more expensive than the American equivalent. Table 7.5 shows that in 1922, a

range of essential components were substantially cheaper in the US compared with Britain.

Table 7.5
The Cost of Essential Car Components in Britain and America for the Year of 1922.

Component	American Equiv. in £'s			British made Components		
	£	s	d	£	s	d
Engine	23	3	3	64	15	6
Electrical Equipment	3	9	6	10	4	11
Carburettor		16	10	1	15	6
Lamps		15	2	4	19	4
Radiator	1	17	6	2	18	0
Body	9	5	3	24	1	3

Source: University of Warwick, MRC, MSS 266/AU/1/1/1(ii), Austin Minute Book, 'Visit of the Chairman and Mr E.L. Payton to the USA,, 1922, p. 10.

The evidence for 1922 was consistent with a later report which reviewed the prices of components and raw materials during the interwar period. The report, which was produced in 1945 by the Reconstruction of the Motor Industry Committee, noted that prior to the war 'American producers had reached a high degree of standardization especially of components and this feature was almost wholly lacking in the British industry'. In contrast, although Britain produced one-tenth the American output, it manufactured over '120 different types of engine as against 30 or 40 in the USA'. The Committee concluded that during the interwar period:

> the price of steel and components is higher here [Britain] than in the USA but again this is partly related to the multiplicity of models calling for large numbers of

> different specifications which are produced in a relatively small quantity.[97]

However, another important factor which highlighted the differences between British and American firms was their overseas trade. Whilst a large proportion of American cars were exported to a world wide market, the vast majority of British firms targeted their domestic market which had been protected since 1915 by the Mckenna Duties. By 1937, only 20 per cent of the output of British private cars were exported.[98] Moreover over 80 per cent of these exports were delivered to the Empire, a market which had similar traits and demands to the British domestic market.[99] Indeed, both of these markets possessed little social depth and instead catered for a small but significant middle class. The extent to which British and American domestic car markets differed was encapsulated in a report produced by Herbert Austin after a visit to America in 1922. Austin calculated that the conditions of living were so vastly different that it would be necessary to add at least 25 per cent, and in some cases 50 per cent, on to American products to arrive at a reasonable comparison to British goods. Significantly, Austin also noted that:

> It was easy to observe that their [working class] spending power generally was considerably in excess of similar classes in our country. A large proportion own cars, and

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[97] Public Record Office (hereafter PRO), CAB 124/626, 'Office of the Minister of Reconstruction. The Motor Industry Post War Reconstruction', 3 and 15 April 1945.
[98] Ibid, 3 April.
[99] PRO, CAB 124/626, Report on the 'Resettlement of the Motor Industry', by J.Jewkes, 28 March 1945.

> we were told that there were well over 200,000 cars in Detroit, which has a population of about 1,100,000.[100]

The strength of the American market is further demonstrated by the fact that of the twelve and half million cars on the road in 1922, almost ten and half million had been purchased in the USA.[101]

With such a small market and with the added pressures of the emergence of a second hand market, British car assemblers were forced into 'competition by variety' during the 1920s and 1930s. Thus in an attempt to attract the middle-class consumers, car manufacturers adopted a policy of annual model changes to stamp an individuality on their designs. A report by J. Jewkes on the nature of the British car market provides an insight into the demands made on the British car firms during the interwar period.

> If it is generally agreed, motoring is and will continue to be one of the semi-luxuries of the public, then the attraction of a motor car lies not merely in the fact that it enables one to travel quickly but also that it is a kind of hobby and a form of social display. If this is true, then to reduce the motor-car to a utility standard would probably tend to cut down the demand for cars. The manufacturer had not introduced variety for the fun of it. He dislikes having to change his jigs and tools every year more than any body else. But he is compelled to do this in order to maintain the existing volume of sales, because when a person buys a car he very frequently attaches great importance to new gadgets and new attractions on it.

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[100] MRC, MSS 266/AU/1/1/1 (ii), Austin Minute Book, 'Visit of the Chairman and Mr E.L. Payton to the USA', 1922, p.p. 4-5.
[101] Ibid, p. 9.

Clearly, then, far from taking the wrong turn on the road to mass production, the British manufacturers' adoption of a more flexible production strategy, through the use of component suppliers, was the optimum policy once the peculiarities of the British market are assessed. Indeed, the rationale behind their production strategy is strengthened further by the experience of American car firms in Britain which traditionally possessed a highly integrated productive system. Jewkes concluded his report by noting that:

> It is not without interest in this competition that the American firm which operates in this country, General Motors, although it mass produces in America, finds it necessary to produce a fair range of types [of car] in this country.[102]

Thus the highly integrated production strategy which enabled American firms to mass produce homogeneously designed cars was a policy which proved unsuccessful in Britain. Similarly, Ford, which was the market leader in Britain prior to the First World War, slipped significantly during the interwar period. Ford's highly integrated system was not flexible enough to allow annual model changes which the largely middle-class dominated market demanded. Consequently by 1929, Ford had dropped into fourth position in the sale of cars, behind Morris, Austin and Singer, capturing only 4 per cent of the market share.[103] A highly integrated system, therefore, was no guarantee of market

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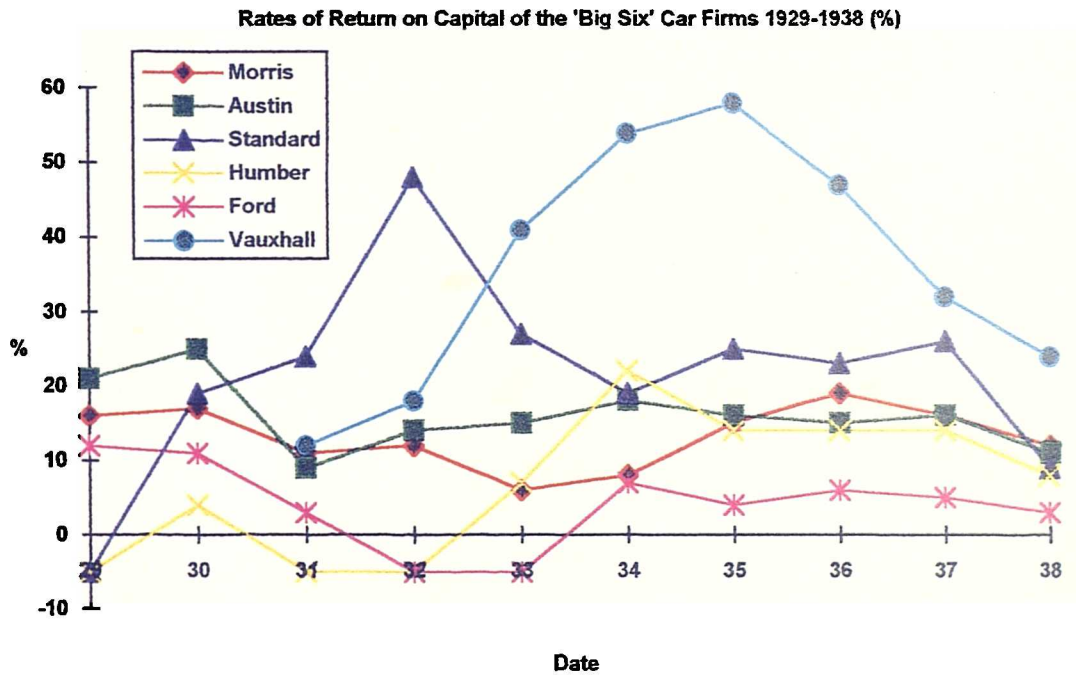
[102] PRO, CAB 124/626, 'Resettlement of the Motor Industry', by J.Jewkes, 28 March 1945.
[103] Maxcy, 'The Motor Industry', p. 367.

dominance. Graph 7.6 demonstrates that between 1929-1938 Ford's rate of return was consistently below that of the other 'Big Six' car manufacturers. The graph also shows clearly that Vauxhall's change in production policy towards a more flexible low integrated structure occurred during the mid-1930s when their rates of return on capital began to increase.

Graph 7.6



*Source: Maxcy and Silberston, **The Motor Industry**, (1959), P. 160.*

In a marked contrast to Ford, the 'Big Six' had adopted the optimum production policy of a vertically dis-integrated structure which allowed annual model changes through the utilisation of external economies.

The interwar era was a period of change and continuity in the relationship between car assemblers and producers. The structural changes in the motor industry which involved an

influx of both car assemblers and component firms into the trade, coupled with the surge towards volume production, encouraged the extensive use of the component sector. However, the instability of the small car assemblers of the 1920s and the demands of the volume producers, added an extra pressure to the already financially weak supply firms. Indeed, it was the buyer's bargaining power which did not alter during this period. The relationship which demanded that component firms cover the cost of re-tooling and supply credit to assemblers were practices which were established prior to the First World War.

Conclusion

This chapter has shown that it is misleading to assume that the British car industry failed to emulated American mass production techniques due to a reluctance to engage in backward integration. Indeed, both Chandler and Lazonick under-play the significant role of the British domestic market in restricting production totals and dictating manufacturing techniques. Moreover, in the case of the British motor industry, the significant role of the car component industry in providing a broad financial support to car assemblers has been ignored. It has also been argued that the factors which helped determine the buyer and supplier relationship between the car assembler and car component maker were closely linked to the changing structure of the motor industry. The financial weakness of many component firms, which had stemmed from diversifying from a

declining cycle industry was reflected in their relationship with car assemblers during the formative years of the motor industry. Indeed, the early assemblers' prime concern of acquiring the cheapest component available while also demanding generous credit terms from their suppliers were practices which continued throughout the period under study. These demands continued to be met by component makers since the change in the structure of the motor industry during the interwar period further weakened their position. The increase in small assemblers and the surge towards volume production by the 'Big 3' encouraged the extensive use of the component sector. The small domestic new car market and the growing second hand market encouraged car manufacturers to make annual model changes, a process which required a flexible production strategy. Indeed, the most flexible approach was the utilisation of the component sector since, with switching costs low, a variety of components could be altered at short notice. Furthermore, in a bid to avoid becoming over-committed to the 'Big 3', component makers gained contracts with the myriad of small assemblers which had entered the industry during the post war boom. For many component firms, this proved a costly exercise, as the failure rate for small assemblers during this period was high, leaving suppliers such as Smith's Stamping with long runs of unpaid and unwanted stock. For assemblers the interwar years proved profitable since, although they increased production and variety into their models, switching costs remained low and the

suppliers were still obliged to offer credit and continued to bear the brunt of re-tooling costs. Thus, when judged in its historical context, it becomes clear the car manufacturer's adoption of low levels of integration was the optimum organisational strategy given the flexibility required for the British car market.

Conclusion

This thesis has identified and evaluated the structure and development of the Coventry car component industry between 1895-1939. The focus on the Coventry car component industry was justified by the city's special contribution to the growth of the British motor industry. The foundations of the British motor industry were laid in Coventry during the 1890s and the city continued to play a central role in the production of components and cars to 1939. However, Coventry's position within the motor industry did undergo change when, during the interwar period, a number of large car assemblers and component suppliers sited factories outside the city. As a consequence, Coventry began to play a more specialised, yet still significant, role in the development of the motor industry. However, although the component industry was dominated by a select few concerns, Coventry component firms reflected a key characteristic of the British component industry since, like its national counterparts, it was derived from a myriad of small firms.

Although the investigation focused on the Coventry car component industry, it has become clear that certain trends have emerged within the industry which possess a relevance to the wider debate concerning the British motor industry and business history in general during this period. The objective of the thesis was to analyse the structure of the Coventry car component industry and investigate its role in the motor industry by (i) the creation of a data base of the number and size of firms (ii) to establish the circumstances surrounding the entry and exit

of firms and the nature of the product market, (iii) examine the sources of finance, (iv) analyse the ownership and management of firms, (v) investigate the extent of rationalization and standardization, and (vi) analyse the supplies and production policy adopted by the car assemblers.

By assessing the competitiveness of the product markets in the five branches of the component trade, it was possible to identify key agents that shaped the industry. Hirschman's model proved invaluable in analysing the nature of competition in the industry since it focused on the exit and loyalty mechanisms. A car assembler (customer) which employed the voice mechanism would almost certainly be trading with a component industry which was not overly competitive. Conversely, the car assembler which consistently selected the exit option was able to take advantage of a supply industry that was highly competitive. The evidence for the Coventry car component industry showed that the structure of competition within the five branches of the trade can be divided into three periods. Between 1895-1912, the high number of component firms entering the trade and the few exits recorded indicated the industry was still in its emergent phase. The continued success of Coventry cycle firms during the mid-1890s and the early variation in the design of cars meant there was virtually no market for the specialist producers. However, the component industry entered its second phase after the motor depression of 1907, when between 1912-1919, car makers began producing vehicles in larger batches. It was significant that this period witnessed a large number of firms entering and leaving the industry. Indeed, the First World War and the post-war car

boom cemented this highly competitive market structure since both factors encouraged the entry of small engineering firms. The final phase identified was the period 1919-1939. Here, there were significant changes in the five branches of the trade. Within the electrical, tyre and wheel branches large firms, with head quarters outside of Coventry, developed monopoly interests, ensuring that a high number of Coventry firms were forced out of these sectors. However, the highly competitive market structure continued in the body sector which recorded high numbers of entries and exits between 1919-1939. In relation to Hirschman's model, the evidence demonstrated that the car assemblers' consistently opted for the exit mechanism in their relationship with their suppliers. Thus the high turnover of firms from 1912-1939, shows that car assemblers were able to take advantage of a highly competitive component industry which was derived of small component firms which possessed a fairly low survival rate.

The research revealed that the vast majority of Coventry car component firms possessed a relatively small capital and were financed by family, friends and contacts within the business community. Moreover, few firms attempted to raise capital through the Stock Exchange due to a reluctance on behalf of the capital markets to finance firms associated with the 'new industries'. Recently, Ross has defended the clearing banks by claiming that the banks were active in providing substantial funds to British industry. However, in Coventry, the banks' financial agreements with firms in the motor industry did not extend past the overdraft facility. Although this financial source proved invaluable to component firms, the overdraft

facility could not be described as a long term investment strategy. Indeed, a bank's intervention into the business policy of a firm occurred only when there appeared a risk to the bank's investment. In these circumstances, business policy was not shaped through the objectives which would have necessarily improved a firm's position in the car component industry, but was instead shaped by the short term aim of safeguarding the bank's loan.

An important structural characteristic of an industry which has aroused much historical debate is the ownership and management of firms. A number of historians such as Chandler, Payne and Lazonick have argued that the family firm was a major causal factor behind Britain's continued reliance on small units of production and ultimately its economic decline between 1870-1939. The family business is characterised as a conservative institution which inhibited the growth of a firm through a reluctance to relinquish any managerial control. Furthermore, the elementary education and engineering apprenticeship, which many founder-owner businessmen experienced, has often been cited as instilling conservative characteristics in its recipients.

Research on the nature of ownership and management in the Coventry car component industry demonstrated that the majority of firms were small family based enterprises. The evidence indicated that the relatively few mergers or publicly floated companies could not be simply attributed to the continuation of family control, but to the highly competitive nature of the industry itself. Indeed, in the few cases where firms did expand, the 'conservative' characteristics of the proprietor were

second to the appeal of greater market shares and larger profits. However, the structure of the component industry, with its low entry and exit barriers generally encouraged the establishment of a myriad of small engineering firms which lacked the resources to merge or issue shares to the public. Thus the structure of the industry gave component firms little opportunity to merge or expand. The thesis also investigated another accusation levelled at the British family businesses, namely that firms lagged behind their American counterparts since they lacked the professionally trained managers. Analysis of the small scale Coventry firms showed that the vast majority relied on family, friends or links with the Coventry business community to both appoint works managers and sales staff. However, given the small scale of the Coventry car component industry, the family firms were not held back by the absence of formally trained management. Of greater importance to firms involved in a supply industry, was the ability of management to integrate fully in the Coventry business community. Even large American subsidiaries adopted this informal and flexible approach by employing large numbers of managers that were based locally. Thus, the manager of BTH, often bypassed the sales staff and official management structures and instead sought personal contacts within the Coventry car component and car assembling industries.

The evidence drawn from the Coventry car component industry indicated that the family firm was more of a *symptom* of the structure of an industry, rather than the dynamic force shaping it. Consequently, the small scale family firms selected the optimum managerial strategy of utilising the close-knit Coventry

business community given the small scale structure of the industry. Historians who have criticised British firms for not creating centralised management structures, de-contextualise their analysis by attempting to impose American managerial models on small scale industrial structures in the belief that larger corporate structures would have *followed* strategy. By contrast, the thesis has argued that three important structures in the Coventry car component industry were shaped by a highly competitive product market. Moreover, research has analysed the factors which determined why the market was so competitive by investigating the demands placed on component makers by the car assemblers between 1895-1939.

Historians such as Maxcy and Silberston, and Turner have claimed that the car component industry was inherently inefficient in three areas relating to the productive process viz. output, technological implementation and the extent of product standardization. This sweeping presupposition has led them to conclude that the component industry was a major constraint on the growth of the motor industry to 1914. The examination of output, technology and standardization within the component industry certainly showed that many firms were deficient in these areas. Short term factors, such as the origin of a firm and the First World War did have a bearing on a firm's ability to engage in repetitive production and implement the latest technology. Coventry firms which had diversified into the component industry from a traditional trade experienced the greatest difficulties in emulating former cycle and munition firms which were conversant in producing long runs of components. The First World War, while enhancing the

productive techniques of firms which continued to manufacture its pre-war product, severely disrupted car component firms which were forced into munition work. Post war conversion proved difficult for many firms since the war-time plant and remaining stock was of little use for the domestic market. However, the chapter identified an institutional rigidity which had a long term affect on the productive efficiency of the car component industry, namely the demands made by the car assemblers. The car assemblers demanded that component makers supplied relatively short runs of non-standardized components throughout the period under study. This ensured that both large and small supply firms were required to hold large quantities of non-standardized stock of which there was no guarantee of sale. This had both a serious drain on component firms' reserve capital and their ability to implement new technology and engage in adequate research and development. Consequently, such demands helped ensure that many component firms were unable to expand through investing reserve capital or attracting external finance. Thus, inefficient productive practices such as short runs of non-standardized components and high stock levels were a characteristic of the Coventry car component industry. However, Maxcy and Silberston, and Tuner's assertion that the car component industry held back the motor industry through a refusal to adopt American mass production techniques is misleading. The car component industry was responding to demands made by the assemblers, demands which focused on small runs of non-standardized components which the American model of mass production would have found impossible to meet. Therefore, since these

demands actually played a role in *shaping* the industry, it was necessary to investigate why car assemblers required the supplies they ordered. Consequently, the thesis has traced the origins and development of the relationship between the car assemblers and component industry to establish how the assemblers were able to take such a powerful negotiating position between 1896-1939.

American historians, such as Chandler, Lazonick and Lewchu k, have been critical of the British motor industry for not integrating production along the lines of the American model. They have argued that backward integration would have encouraged mass production and created an efficient productive process which would have been devoid of bottle-necks and related problems with suppliers.

The analysis of the component firm's interaction with the car assemblers demonstrated that it was more complex than the conventional buyer and seller relationship. Car assemblers were able to transfer production costs such as re-tooling, research and development, and stock levels to a financially weak car component industry. The financial weakness of many component firms which had stemmed from diversifying from a traditional declining industry, ensured that, by 1914, car assemblers were able to take up a powerful bargaining position. Moreover, the financial weakness of the component industry enabled car assemblers to extract substantial credit from their suppliers, an advantage which saved many car makers from almost certain bankruptcy. Thus far from retarding the growth of the motor industry, the component industry was instrumental in reducing production costs and providing broad financial support to car

assemblers. When viewed in its historical context, the assemblers' use of the component sector for up to 75 per cent of components between 1918-1939, was the optimum production strategy. The output of long runs of standardized components by vertically integrated car manufacturers would have been an inappropriate response to Britain's car market, which unlike America, was devoid of homogenous tastes and social depth. To compete in a small middle-class market, which by the 1930s was being squeezed by the sale of second hand vehicles, car manufacturers entered into competition by variety. Rapid changes in car fashion called for a flexible production approach which could incorporate frequent changes in model designs. For this reason British manufacturers opted for low levels of integration and continued to utilise the small car component firms scattered across the West Midlands and the Southeast.

This thesis has argued that the car component industry can only be understood when it is analysed within the context of the demands made by the motor industry. In contrast to historians who have suggested that the component sector held back the motor industry in Britain, the study has shown that the car assemblers actually *shaped* the component industry to meet the needs of their own production strategy. Moreover, it has also been asserted that historians who have attempted to analyse the motor industry, purely in terms of the car assemblers, neglect the important production strategies that car assemblers adopted by utilising the component industry. By overlooking *why* these strategies were implemented, historians have assumed that the British car industry adopted a dis-integrated production strategy due to either managerial failure or labour resistance to Fordism.

The analysis on a broader level challenges Chandler's thesis which asserted that structure *followed* strategy. This study has adopted a holistic analysis of the motor industry which showed that Britain's imperfect domestic car market created a highly competitive car component industry that was shaped by assemblers' demands. Thus the small scale of the Coventry car component industry merely reflected Britain's domestic car market rather than deficiencies in strategy at managerial level.

Appendix I

Car Component Firms in Coventry 1902

Firm	Date Est	Origins	Product
Allard		Coach	Bodies
Baker		Coach	Bodies
City Carriage	1849	Coach	Bodies
Hawkins		Coach	Bodies
Hollick		Coach	Bodies
Mills Fullford		Coach	Bodies
Pass. Thomas	1850	Coach	Bodies
Kalker	1901	Est as a Car Component Co	Electrical
Rotherhams		Watches	Electrical
Van Raden	1898	Est as a Car Component Co	Electrical
Bayliss		Cycles	Engine/Comp
Forman	1901	Est as a Car Component Co	Engine/Comp
Simplex		Est as a Car Component Co	Engine/Comp
White and Poppe	1899	Military	Engine/Comp
Automachinery	1896	Cycle	Other (Steel Balls)
Coventry Chain	1896	Cycles	Other (Chains)
Crawford Gear		Cycles	Other (Gears)
Dover	1893	Cycles	Other (Steering Wheels)
Coventry Motor Fittings	1902	Est as a Car Component Co	Radiators
Coventry Radiator	1883	Cycles	Radiators
Doherty	1902	Est as a Car Component Co	Radiators
Albion Drop Forging	1900	Est as a Car Component Co	Casting/stamp
Brett's Stamping	1896	Cycles	Casting/stamp
Coventry Malleable	1884	Cycles	Casting/stamp
Smith's Stamping	1896	Cycles	Casting/stamp
Coventry Swaging	1896	Cycles	Unspecified
Clipper Tyres	1898	Cycles	Wheels/Tyres
Dunlop	1893	Cycles	Wheels/Tyres

Sources: Kelly's Directory of Warwickshire 1900, Ryland's Directory of Iron, Steel & Allied Trades 1902, Motor Manufacturers of Coventry (Museum of British Road Transport), Autocar, The Motor, Lloyds Bank Coventry branch Archive, Midland Bank Coventry branch Archive.

Car Component Firms in Coventry 1912

Albert Mason	1911	Unknown	Bodies
Awson Motor Carriage		Unknown	Bodies
Baker		Coach	Bodies
Charlesworth		Coach	Bodies
City Carriage Co	1849	Coach	Bodies
Coventry Motor Bodies		Unknown	Bodies
Foleshill Motor & Carriage Wks		Unknown	Bodies
Hawkins	1895	Coach (1900)	Bodies
Hewers Car Bodies		Unknown	Bodies
Hobley, Thomas		Coach	Bodies
Holley		Unknown	Bodies
Hollick & Pratt		Coach	Bodies
Mills Fulford	1899	Unknown	Bodies
Parkside Motor Bodies	1912	Unknown	Bodies
Pass. T	1850	Coach (1900)	Bodies
Viking Car Carriage		Unknown	Bodies
Albion Drop Forging	1900	Est as Car Comp Co	Casting/Stamping
Brett's Stamping	1896	Cycles	Casting/Stamping
Coventry Malleable	1884 (1900)	General Castings	Casting/Stamping
Pheonix Motor Castings	1908	Est as a Car Component Co	Casting/Stamping
Smith's Stamping	1896	Cycles (1900)	Casting/Stamping
Coventry Electrical Company		Unknown	Electrical
Coventry Watch Movement Co	1889	Cycles (1903)	Electrical

Eagle	1912-1913	Est as a Car Component Co	Electrical
Kalker	1901	Est as a Car Component Co	Electrical
ML Magneto	1908	General Electrical	Electrical
Rothehams		Cycles	Electrical
United Motor Industries		Unknown	Electrical
Van Raden	1898	Est as a Car Component Co	Electrical
Barnett Co		Unknown	Engines/Comp
Bayliss		Cycles (1902)	Engines/comp
British Piston Ring	1911	Machine Tool (1911)	Engine/comp
Condor Motor Co		Unknown	Engines/Comp
Cromwell Engineering		Unknown	Engines/Comp
E.J. Hardy	1890s	Cycles (1903)	Engine/comp
Forman	1901-1912	Est as a Car Component Co	Engines/comp
Johnston, Hurley & Martin	1904	Est as a Car Component Co	Engines/comp
Motor Accessories Company	1911	Est as a Car Component Co	Engines/comp
Payne & Co		Cars/Gas Engines	Engines/comp
Pistons	1911	Est as Car Comp	Engines/comp
Remmington Motor Co		Unknown	Engines/Comp
Simplex		Est as as Car Component Co	Engines/comp
White & Poppe	1899	Military (1901)	Engines/comp
Automachinery		Cycle	Other (Steel Balls)
Coventry Chain	1896	Cycles (1900)	Other (Chains)

Dover	1893	Cycles	Other (Steering Wheels)
Coventry Motor Fittings	1902	Est as a Car Component Co	Radiators
Coventry Radiator	1883	Cycles	Radiators
Doherty	1901	Est as a Car Component Co	Radiators
Motor Raditor		Est as a Car Component Co	Radiator
Randle Radiator	1909	Est as a Car Component Co	Radiators
Bluemels	1891	1907	Unspecified
Bramco		Cycles	Unspecified
Coventry Motor Accessories		Est as Car Component Co	Unspecified
Coventry Ordnance Works	1905	Military (1907)	Unspecified
Coventry Swaging	1896	Cycles (1900)	Unspecified
Mascot		Unknown	Unspecified
Priory Motor Accesories	1910	Est as Car Compoents	Unspecified
Captain Ring		Unknown	Wheels/Tyres
Coventry Wheel Company		Cycles	Wheels/Tyres
Dunlop	1893	Cycles (1900)	Wheels/Tyres

Sources: Ryland's Directory of Coventry, Kelly's Directory of Warwickshire, The Motor, Autocar, Lloyds Bank Coventry District Archive, Midland Bank Coventry District Archive.

Car Component Firms in Coventry 1919

Atkinson. S.F.	1913-1919	Unknown	Bodies
Awson		Unknown	Bodies
Baker		Coach	Bodies
Charlesworth		Coach	Bodies
City Carriage Co		Coach	Bodies
Coventry Motor & Sundries		Est as a Car Comp Co	Bodies
Earlsdon Motor Body Co		Est as a Car Comp Co	Bodies
Foleshill Motor & Carriage Wks		Unknown	Bodies
Hollick and Pratt		Coach	Bodies
Midland Light Bodies	1913-1919	Est as Car Component Co	Bodies
Midland Motor Body Co	1913-1919	Unknown	Bodies
Mills Fulford	1899	Unknown	Bodies
Parkside Motor Bodies	1912	Unknown	Bodies
Pass. T	1850	Coach (1900)	Bodies
Albion Drop Forging	1900	Est as Car Comp Co	Casting/Stamping
Brett's Stamping	1896	Cycles	Casting/Stamping
Britannia		General Casting	Casting/Stamping
Clarke & More		Unknown	Casting/Stamping
Cov Motor Foundry		Est as Car Component Co	Casting/Stamp
Coventry Malleable	1884 (1900)	General Castings	Casting/Stamping
Coventry Plating & Press Wks	1913-1919	Est as a Car Comp Co	Casting/Stamping
Holbrook Foundry	1919	Est as a Car Comp Co	Casting/Stamping

Middlemores		Leather accessories	Casting/Stamping
Pheonix Motor Castings	1908	Est as a Car Component Co	Casting/Stamping
Reliance Sheet Metal	1913-1919	Est as a Car Component Co	Castings'Stampings
Rowland Hill & Sons	1859 (1901)	General Castings	Casting/Stamping
Smith's Stamping	1896	Cycles (1900)	Casting/Stamping
Star Foundry		Unknown	Casting/Stamping
Sterling Metals		Unknown	Casting/Stamping
Bonniksen, B.	1913-1919	Est as Car Comp Co	Electrical
British Thompson Houston	1912	Est as a Car Component Co	Electrical
Coventry Electrical Company		Unknown	Electrical
Coventry Magneto	1914	Est as a Car Component Co	Electrical
Coventry Watch Movement Co	1889	Cycles (1903)	Electrical
Kalker	1901	Est as a Car Component Co	Electrical
ML Magneto	1908	General Electrical	Electrical
Rothehams		Cycles	Electrical
Van Raden	1898	Est as a Car Component Co	Electrical
Bayliss		Cycles (1902)	Engines/comp
British Piston Ring	1909	Machine Tool (1911)	Engine/comp
Condor Motor Co		Unknown	Engines/Comp
Cromwell		Est as Car Component Co	Engines/Comp
E.J. Hardy	1890s	Cycles (1903)	Engine/comp

Holkey Bros	1913-1919	Est as a Car Comp Co	Engines/Comp
Hotchkiss	1915	Est as Car Component Co	Engines/Comp
Johnston, Hurley & Martin	1904	Est as a Car Component Co	Engines/comp
Motor Accessories Company	1911	Est as a Car Component Co	Engines/comp
Nero Engine Co	1915	Est as a Car Comp Co	Engines/Comp
Payne & Co		Cars/Gas Engines	Engines/comp
Pistons	1911	Est as Car Comp	Engines/comp
Remington Motor Co		Unknown	Engines/Comp
Riley Engine Co		Est as a Car Comp Co	Engines/Comp
Simplex		Est as as Car Component Co	Engines/comp
Valves Ltd	1915	Est as a Car Component Co	Engines/Comp
White & Poppe	1899	Military (1901)	Engines/comp
Auto'ionery		Cycle	Other (Steel Balls)
Coventry Chain	1896	Cycles (1900)	Other (Chains)
Dover	1893	Cycles	Other (Steering Wheels)
Coventry Motor Fittings	1902	Est as a Car Component Co	Radiators
Coventry Radiator	1883	Cycles	Radiators
Doherty	1901	Est as a Car Component Co	Radiators
Eclipse Motor Fittings	1913-1919	Est as a Car Comp Co	Radiators

Excell Radiator and Sheet Metal Co	1913-1919	Est as a Car Comp Co	Radiators
Randle Radiator	1909	Est as a Car Component Co	Radiators
Bluemels	1891	1907	Unspecified
Bramco		Cycles	Unspecified
Coventry Swaging	1896	Cycles (1900)	Unspecified
General Accessories Supply Co	1913-1919	Est as a Car Component Co	Unspecified
Gilford Motor Accessories	1913-1919	Est as a Car Component Co	Unspecified
Holf Motor Accessories	1913-1919	Est as a Car Component Co	Unspecified
Lake & Elliot	1913-1919	Est as a Car Component Co	Unspecified
Page & Key	1913-1919	Est as a Car Component Co	Unspecified
Spencer Bros	1913-1919	Est as a Car Component Co	Unspecified
White & Co	1913-1919	Est as a Car Component Co	Unspecified
Wolf & Co	1913-1919	Est as a Car Component Co	Unspecified
Captain Ring		Unknown	Wheels/Tyres
Dunlop	1893	Cycles (1900)	Wheels/Tyres
Coventry Wheel Company		Cycles	Wheels/Tyres

Sources: Ryland's Directory of Coventry, Spennell's Directory of the City of Coventry, Kelly's Directory of Warwickshire, Lloyds Bank Coventry district archive, Midland Bank Coventry district archive.

Car Component Firms 1926

Firm		**Location HO**	**Product**
Awson Motor		Coventry	Bodies
Carbodies		Coventry	Bodies
Caton Co		Coventry	Bodies
Charlesworth		Coventry	Bodies
Cheylesmore Sheet Metal		Coventry	Bodies
City Carriage Wks		Coventry	Bodies
Commercial Dome Wing		Coventry	Bodies
Cross & Ellis		Coventry	Bodies
Eaves & Barratt		Coventry	Bodies
Midland Light Bodies		Coventry	Bodies
Midland Motor Bodies		Coventry	Bodies
Mills Fulford		Coventry	Bodies
Morris Motor Bodies		Oxford *	Bodies
Motor Panels		Coventry	Bodies
Pass Thomas		Coventry	Bodies
Bryant. E		Coventry	Bodies
Hanock & Warman		Coventry	Bodies
Foleshill Carriage		Coventry	Bodies
Ward. W.E.		Coventry	Bodies
Coventry Motor Wings		Coventry	Bodies
Midland Motor Bodies		Coventry	Bodies
Albion Drop Forging		Coventry	Casting/Stamp
Brett's		London	Casting/Stamp
Britannia Foundry		Coventry	Casting/stamp
Clarendon Pressings		Coventry	Casting/Stamp
Cov Motor Foundry		Coventry	Casting/Stamp

Coventry Malleable		Coventry	Casting/Stamp
Fozel Castings		Coventry	Casting stamp
Holbrook Foundry		Coventry	Casting Stamp
Middlemores		Coventry	Casting Stamp
Pheonix Castings		Coventry	Casting/Stamp
Reliance Sheet Metal		Coventry	Casting/stamp
Smiths		Coventry	Casting Stamp
Sterling Metals		Coventry	Casting/Stamp
Bryce (Formerly Highfield Rd Elec Co)		Coventry	Electrical
BTH		London *	Electical
Coventry Magneto		Coventry	Electrical
ML Magneto		Coventry	Electrical
Saunders Electrical		Coventry	Electrical
Van Raden		Coventry	Electrical
British Piston Ring		Coventry	Engines/Comp
Condor Motor & Fittings		Coventry	Engines/Comp
Cov Movement Co		Coventry	Engines/Comp
Cromwell Engineering		Coventry	Engines/Comp
Johnston Hurley and Martin		Coventry	Engines/Comp
Morris Motors		Oxford *	Engines/Comp
Page & Hardy		Coventry	Engines/Comp
Payne & Co		Coventry	Engines/Comp
Pistons		Coventry	Engine/Comp
Riley Engine		Coventry	Engines/Comp
Rotherams		Coventry	Engines/Comp
Valves Ltd		Coventry	Engines/Comp
Autohoods		Coventry	Other (Hoods)

Automach		Coventry	Other (Steel balls)
Bramble Sheet Metal		Coventry	Other (bonnets)
Brooke		Coventry	Other (Trimmings)
Calso Hoods		Coventry	Other (Hoods)
Cornercroft		Coventry	Other (Discs)
Coventry Chain		Manchester	Other (Chains)
Fry & Co		Coventry	Other (Hoods)
Harnell Engineering		Coventry	Other (Bolts/pins)
Cov Motor & Sundries		Coventry	Radiators
Cov Motor Fittings		Coventry	Radiators
Cov Radiator		Coventry	Radiators
Eclipse Motor Fittings		Coventry	Radiators
Randle Rad		Coventry	Radiators
Barnes Acess		Coventry	Unspecified
Blumel Bros		Coventry	Unspecified
Coventry Equipment		Coventry	Unspecified
Earl Engineering		Coventry	Unspecified
General Accessory Supply		Coventry	Unspecified
Godiva Engineering & Motor Works		Coventry	Unspecified
H.O.M Cabinet		Coventry	Unspecified
Holt Motor Accessory		Coventry	Unspecified
Lake & Elliot		Coventry	Unspecified
Torrington Co		London	Unspecified
Wal Car Equipment		Coventry	Unspecified
Wantnaby & Son		Coventry	Unspecified
White & Co		Coventry	Unspecified

Dunlop Rim & Wheel		London *	Wheels/Tyres
Warland Rim		Coventry	Wheels/Tyres

Sources: Ryland's Directory of Coventry, Spennell's Directory of the City of Coventry, Kelly's Directory of Warwickshire, Lloyds Bank Coventry district archive, Midland Bank Coventry district archive.

Car Component Firms in Coventry 1936

Firm		**Location of HO**	**Product**
Awson Motor		Coventry	Bodies
Butlins Coach		Coventry	Bodies
Carbodies		Coventry	Bodies
Caton Co		Coventry	Bodies
Charlesworth		Coventry	Bodies
Cheylesmore Sheet metal		Coventry	Bodies
City Carriage Wks		Coventry	Bodies
Commercial Dome Wing		Coventry	Bodies
Cov Hood & Sidescreen		Coventry	Bodies
Cov Motor & Sundries		Coventry	Bodies
Coventry General Welding		Coventry	Bodies
Cross & Ellis		Coventry	Bodies
Eaves & Son		Coventry	Bodies
Fisher & Ludlow		Birmingham	Bodies
Keight		Coventry	Bodies
Letchford Swift		Coventry	Bodies
Midland Light Bodies		Coventry	Bodies
Midland Motor Bodies		Coventry	Bodies
Mills Fulford		Coventry	Bodies
Morris Motor Bodies		Oxford *	Bodies
Motor Panels		Coventry	Bodies
Swallow Coach		Coventry	Bodies
Universal Panels		Coventry	Bodies
Willis Panel		Coventry	Bodies
Albion Drop Forging		Coventry	Casting/Stamp
Brett's		London	Casting/Stamp

Clarendon Pressings		Coventry	Casting/Stamp
Cov Chrominum Plating Co		Coventry	Casting/Stamp
Cov Motor Foundry		Coventry	Casting/Stamp
Holbrook Foundry		Coventry	Casting/Stamp
Middlemores		Coventry	Casting/Stamp
Pheonix Castings		Coventry	Casting/Stamp
Reliance Sheet Metal		Coventry	Casting/stamp
Smiths		Coventry	Casting/Stamp
Sterling Metals		Coventry	Casting/Stamp
Bryce (Formerly Highfield Rd Elec Co)		Coventry	Electrical
Coventry Magneto		Coventry	Electrical
Midland Components		Coventry	Electrical
Van Raden		Coventry	Electrical
Alpha Eng		Coventry	Engines/Comp
British Ring		Coventry	Engines/Comp
Cov Movement Co		Coventry	Engines/Comp
Morris Motors		Oxford *	Engines/Comp
Pistons		Coventry	Engine/Comp
Riley Engine		Coventry	Engines/Comp
Rotherams		Coventry	Engines/Comp
Valves Ltd		Coventry	Engines/Comp
Automach		Coventry	Other (Steel balls)
Brooke		Coventry	Other (Trimmings)
Cornercroft		London *	Other (Discs)
Gears & Components		Coventry	Other (Gears)
Harnell Engineering		Coventry	Other (Bolts/pins)

Iso Speedic		Coventry	Other (Speedo/guages)
Renold Chain		Manchester	Other (Chains)
Self Changing Gears		Coventry	Other (Gears)
Cov Motor Fittings		Coventry	Radiators
Cov Radiator		Coventry	Radiators
Randle Rad		Coventry	Radiators
Barnes Acess		Coventry	Unspecified
Blumel Bros		Coventry	Unspecified
Torrington Co		Coventry	Unspecified
Dunlop Rim & Wheel		London *	Wheels/Tyres

Sources: Ryland's Directory of Coventry, Spennell's Directory of the City of Coventry, Kelly's Directory of Warwickshire, Lloyds Bank Coventry district archive, Midland Bank Coventry district archive.

Appendix II

A Sample of Directors and Shareholders in the Coventry Car Component Industry, 1895-1939

NAME	FIRM	RES. LOCATION	OCCUPATION	SHARES	FOUNDER	FAMILY	MAN	CLASS	YR.	DIR.	CAPTIAL OF FIRM
Adams HA	Brett's Stamping Ltd	Coventry	Artist	1	N	N	N	2	1896	Y	40,000
Allitt T	Nero Engine Co	Coventry	Representative	83	N	N	N	2	1914	Y	4,373
Archer JH	Nero Engine Co	Coventry	Wks Manager	100	N	N	N	2	1914	Y	4,373
Archer JH	Harnall Engineering Co	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Ashmore A	Holbrook Foundry Ltd	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Aston HC	Smith's Stamping	Unknown	Manager	Unknown	N	N	Y	2	1936	Y	250,000
Baker HJ	Mills & Fulford	Coventry	Manu	Unknown	Y	N	N	2	1903	Y	Unknown
Baker HJ	Brett's Stamping	Coventry	Daimler Director	Unknown	N	N	N	2	1936	Y	60,000
Baker HJ	Brett's Stamping	Coventry	Director of Daimler	Unknown	N	N	N	2	1899	Y	19,477
Bambrick GS	Coventry Chain Co	Unknown	Unknown	250	N	N	N	0	1907	N	100,000
Bambrick WR	Coventry Chain Co	Unknown	Unknown	250	N	N	N	0	1907	N	100,000
Barnes E	Barnes Accessories Ltd	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Barnes J	Barnes Accessories Ltd	Coventry	Engineer	Unknown	N	Y	N	2	1936	Y	Unknown
Bates G	Payne & Bates	Coventry	Engineer	0	Y	Y	N	2	1897	Y	2,000
Bear EC	Universal Panels	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Bednell A	Bluemel Bros	Coventry	Agent	Unknown	N	N	N	2	1929	Y	90,000
Bednell A	Cheylesmore Sheet Metal	Coventry	Agent	Unknown	N	N	N	2	1936	Y	Unknown
Bednell A	TG John	Coventry	Agent	Unknown	N	N	N	2	1919	Y	16,000
Bednell A	Zephyr Carburetters Ltd	Coventry	Agent	Unknown	N	N	N	2	1919	Y	10,000
Bednell W	Gen Accessory Supp Co	Coventry	Agent	1,000	N	N	N	2	1920	Y	1,486
Bedworth C	Thos Pass	Coventry	Gentleman	1,000	N	N	N	1	1914	Y	2,000
Beharrell JG	Dunlop Rim & Wheel	Unknown	Unknown	Unknown	N	N	Y	0	1926	Y	34,000
Bennett WH	Gen Accessory Supp Co	Coventry	Clerk	Unknown	N	N	N	2	1919	Y	486
Bergin L	Dunlop Rim & Wheel	Unknown	Unknown	Unknown	N	N	N	0	1915	Y	34,000
Bill AL	Brett's Stamping Ltd	Coventry	Silk Merchant	1	N	N	N	2	1896	Y	40,000
Binley JM	Brett's Stamping Ltd	Coventry	Clerk	1	N	N	N	2	1896	Y	40,000
Birkett W	Cov Motor Foundry	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Blakemore JN	Valves Ltd	Unknown	Unknown	500	N	N	N	0	1932	N	8,000
Bloomfield CW	Bryce Ltd	Coventry	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Bluemel CW	Bluemel Bros	Coventry	Component Manu	Unknown	Y	Y	N	1	1936	Y	90,000
Bluemel CW	Bluemel Bros	Coventry	Component Comp	Unknown	Y	Y	N	1	1913	Y	40,000
Bluemel EA	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1913	Y	40,000
Bluemel EA	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1936	Y	90,000
Bluemel FH	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1913	Y	40,000
Bluemel FW	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1922	Y	60,000
Bluemel FW	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1936	Y	90,000
Bluemel RE	Bluemel Bros	Coventry	Component Manu	Unknown	N	Y	N	1	1936	Y	90,000
Bolton E	Cov Movement Co	Coventry	Engineer	Unknown	N	N	N	2	1936	Y	Unknown
Bradbury HF	Coventry Chain Co	Unknown	Unknown	300	N	N	N	0	1907	N	100,000
Bradbury SG	Cheylesmore Sheet Metal	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Brett A	Albion Drop Forgings	Coventry	Engineer	350	Y	N	N	2	1904	Y	2,000
Brett A	Albion Drop Forgings	Coventry	Engineer	100	Y	N	N	2	1904	Y	2,000
Brett A	Nero Engine Co	Coventry	Component Manu	600	Y	N	N	2	1914	Y	4,373
Brett EG	Brett's Stamping Ltd	Coventry	Engineer	1	Y	Y	N	2	1896	Y	40,000
Brett ES	Brett's Stamping	Coventry	Manu	Unknown	Y	N	N	2	1899	Y	19,477
Brockhose J	Albion Drop Forging	Unknown	Unknown	Unknown	N	Y	N	0	1936	Y	Unknown
Brockhouse JT	Albion Drop Forging	Unknown	Unknown	Unknown	N	Y	N	0	1936	Y	Unknown
Brooke A	Brooke Alec Ltd	Coventry	Unknown	Unknown	Y	Y	N	2	1936	Y	Unknown
Buch MA	Max Buch	Coventry	Unknown	Unknown	Y	Y	N	2	1936	Y	Unknown
Bull NB	Letchford Swifts Motor Panel Co	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown

NAME	FIRM	RES. LOCATION	OCCUPATION	SHARES	FOUNDER	FAMILY	MAN	CLASS	YR.	DIR.	CAPTIAL OF FIRM
Bullock EM	Valves Ltd	Coventry	Component Manu	Unknown	N	N	N	2	1936	Y	8,000
Bullock F	Pistons Ltd	Coventry	Engineer	Unknown	Y	Y	N	2	1911	Y	500
Bullock FE	Valves Ltd	Coventry	Component Manu	650	Y	Y	N	2	1916	Y	1,010
Bullock FE	Valves Ltd	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	8,000
Bullock FE	Valves Ltd	Coventry	Component Manu	2,500	Y	Y	N	2	1932	Y	8,000
Bullock WE	Valves Ltd	Coventry	Car Manu	60	Y	Y	N	2	1916	Y	1,010
Bullock WE	Valves Ltd	Coventry	Car Manu	750	Y	Y	N	2	1832	Y	8,000
Burton EB	Albion Drop Forging	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Bush AH	Coventry Chain Co	Coventry	Manufacturer	200	N	N	N	2	1907	N	100,000
Butlin JH	JH Butlin	Coventry	Body Builder	Unknown	Y	Y	N	2	1933	Y	Unknown
Byrne EJ	Clipper Pneum Tyre Co	Coventry	Comp Manu	Unknown	Y	N	N	2	1899	Y	130,008
Byrne JF	Smith's Stamping	Lincoln	Manager	Unknown	N	N	Y	2	1936	Y	250,000
Carson WH	Van Raden & Co	Unknown	Unknown	1	N	N	N	0	1903	N	5,004
Caton H	Henry Caton & Co	Coventry	Unknown	Unknown	Y	Y	N	2	1936	Y	Unknown
Cattanch RS	Coventry Chain Co	Unknown	Co Director	Unknown	N	N	N	2	1915	Y	100,000
Centaur Tool Wks	Nero Engine Co	B'ham	B'ham Manu	300	N	N	N	0	1914	N	4,373
Chaplin JT	Mills Fulford	Coventry	Body Builder	Unknown	N	Y	N	2	1936	Y	Unknown
Cheevas FH	Torrington Co Ltd	USA	Manager	0	N	N	Y	2	1929	Y	5,000
Chesire JN	Universal Panels	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Chiswick SD	Valves Ltd	Unknown	Unknown	500	N	N	N	0	1932	N	8,000
Clark CC	Smith's Stamping	Unknown	Manager	Unknown	N	N	Y	2	1936	Y	250,000
Cleverland A	Forman Motor Co	London	Gentleman	951	Y	N	N	1	1908	Y	1,427
Cleverland A	Forman Motor Co	London	Gentleman	950	Y	N	N	1	1903	Y	1,430
Cooper GB	Automachinery	London	Cycle Manu	101	N	N	N	2	1887	Y	805
Copson JC	Zephyr Carburetters Ltd	Coventry	Unknown	Unknown	N	N	N	2	1919	Y	10,000
Corner A	Cornercroft	Coventry	MD	Unknown	Y	N	N	2	1936	Y	250,000
Corner JA	Cornercroft	Coventry	Component Manu	534	Y	Y	N	2	1927	Y	2,589
Corson FR	Automachinery	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Cotton JW	Charlesworth Bodies	Coventry	Unknown	Unknown	N	N	N	0	1907	Y	Unknown
Craig HB	Hewer Car Bodies	Ireland	Gentleman	500	N	N	N	1	1908	N	2,357
Cursons HV	Forman Motor Co	London	Clerk	1	N	N	N	2	1903	N	1,430
Cutler CT	Bluemel Bros	Unknown	Unknown	Unknown	N	N	N	0	1913	Y	40,000
Davies J	Charlesworth Bodies	Covenrtry	Unknown	Unknown	N	N	N	0	1907	Y	Unknown
Davies J	Climax Co	Coventry	Unknown	Unknown	N	N	N	0	1904	N	5,000
Dick TS	Automachinery	Coventry	MD	Unknown	N	Y	N	2	1936	Y	Unknown
Doherty	Doherty Motor Access Co	Coventry	Engineer	100	Y	N	N	2	1903	Y	200
Doley	Pistons Ltd	B'ham	Manu	Unknown	Y	Y	N	2	1911	Y	500
Dover AE	Dover Ltd	Northampton	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Dover JA	Dover Ltd	Northampton	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Drake BM	Coventry Chain Co	Unknown	Unknwon	500	N	N	N	0	1907	N	100,000
Du Cros A	Dunlop Rim & Wheel	Coventry	Component Manu	Unknown	Y	Y	N	1	1915	Y	34,000
Du Cros H	Dunlop Rim & Wheel	Coventry	Component Manu	Unknown	Y	Y	N	1	1915	Y	34,000
Eaves H	H Eaves & Son	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Ellis AC	Willis Panel Co	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Ellis AJ	Cross & Ellis Ltd	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
England W	Forman Motor Co	London	Clerk	1	N	N	N	2	19103	N	1,430
Everitt AH	Holbrook Foundry Ltd	Coventry	Component Manu	Unknown	N	N	N	2	1936	Y	Unknown
Ford WC	Univeral Panels	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Forman CE	Forman Motor Co	Coventry	Component Manu	475	Y	N	N	2	1903	Y	1,430
Forman CE	Forman Motor Co	Coventry	Engineer	401	Y	N	N	2	1908	Y	1,427
Foster AE	Coventry Magneto Co	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Foster CFH	Coventry Magneto Co	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown

NAME	FIRM	RES. LOCATION	OCCUPATION	SHARES	FOUNDER	FAMILY	MAN	CLASS	YR.	DIR.	CAPTIAL OF FIRM
Francis C	Automachinery	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Fulford	Mills & Fulford	Coventry	Manu	Unknown	Y	N	N	2	1903	Y	Unknown
Gage A	Motor Panels	B'ham	Manager	Unknown	N	N	Y	2	1936	Y	Unknown
Garrett AL	Coventry Motor Fittings	Coventry	Component Manu	12,000	N	Y	N	2	1917	Y	12,000
Garrett L	Cov Motor Fittings	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Garrett L	Cov Motor Fittings	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Gilblert FK	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1939	Y	100,000
Goff CW	Coventry Chain Co	Coventry	Co Director	250	N	N	N	1	1907	Y	100,000
Gooding N	Hewer Car Bodies	Coventry	Manu	100	N	N	N	2	1908	N	2,357
Goodyear C	Dunlop Rim & Wheel	London	Co Director	Unknown	N	N	Y	0	1926	Y	34,000
Goodyear EF	*Dunlop* Rim & Wheel	London	Co Director	Unknown	N	N	Y	0	1926	Y	34,000
Graham JM	Coventry Cahin Co	Unknown	Unknown	200	N	N	N	0	1907	N	100,000
Graham JM	Coventry Chain Co	Unknown	Unknown	2,000	N	N	N	0	1907	N	100,000
Grant GT	Coventry Chain Co	Unknown	Unknown	200	N	N	N	0	1907	N	100,000
Green FM	Coventry Chain Co	Unknown	Unknown	500	N	N	N	0	1907	N	100,000
Green HS	Letchford Swifts Motor Panel Co	Coventry	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Griffiths J	Middlemores	Unknown	Unknown	Unknown	N	N	N	2	1914	Y	4,988
Griffiths J	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	2	1914	Y	19,477
Grimes HWS	Climax Co	Coventry	Unknown	Unknown	N	N	N	0	1904	N	5,000
Grindlay A	Cov Motor & Sundries Co Ltd	Coventry	Component Manu	8,000	Y	Y	N	2	1927	Y	8,000
Grindlay A	Cov Motor & Sundries Co Ltd	Coventry	Component Manu	4,000	Y	Y	N	2	1924	Y	8,000
Grindlay A	Cov Motor & Sundries	Coventry	Component Manu	Unknown	Y	N	N	2	1936	Y	Unknown
Grindlay ASC	Cov Motor & Sundries	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Grindlay RR	Cov Motor & Sundries	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Griswell EC	ML Magneto	New Market	Engineer	500	N	N	N	2	1915	N	15,000
Grovenor A	Whitley Motor Eng Co	Coventry	Manu	250	Y	N	N	2	1902	Y	500
Groves E	Hewer Car Bodies	Coventry	Manu	1	Y	N	N	2	1908	Y	2,357
Hale P	Nero Engine Co	London	Co Director	250	N	N	N	2	1914	Y	4,373
Hamms AR	*Forman* Motor Co	London	Clerk	1	N	N	N	2	1903	N	1,430
Hardy EJ	EJ Hardy	Coventry	Engineer	150	Y	N	N	2	1903	Y	150
Harman C	Coventry Chain Co	Unknown	Unknown	100	N	N	N	0	1907	N	100,000
Hatfiled CE	Coventry Motor Fittings	Coventry	Engineer	3,961	Y	Y	N	2	1914	Y	14,101
Haynes HN	Albion Drop Forgings	Coventry	Unknown	400	Y	N	N	2	1904	Y	2,000
Haynes NH	Brett's Stamping	Coventry	Component manu	Unknown	N	N	N	2	1939	Y	100,000
Haynes WS	Valves Ltd	Coventry	Co Director	334	N	N	N	2	1932	Y	8,000
Hayward W	Harnall Engineering Co	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Heatley WS	Valves Ltd	Coventry	Manager	350	N	N	N	2	1932	Y	8,000
Herbert FM	Automachinery	Coventry	Wife of Cycle Manu	1	N	Y	N	1	1887	N	805
Herbert WH	Automachinery	Coventry	Cycle Manu	126	Y	Y	N	1	1887	N	805
Heublein AC	Coventry Chain Co	Unknown	Unknown	400	N	N	N	0	1907	N	100,000
Heublein GF	Coventry Chain Co	Unknown	Unknown	2,000	N	N	N	0	1907	N	100,000
Hewer E	Hewer Car Bodies	Coventry & Warks	Body Builder	254	Y	N	N	2	1908	Y	2,357
Hewitt W	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	19,477
Hewitt W	Coventry Chain Co	Unknown	Unknown	250	N	N	N	0	1907	N	100,000
Hill A	Brit Piston Ring Co	Coventry	Co Director	Unknown	Y	Y	N	2	1911	Y	4,000
Hill AS	Bluemel Bros	Coventry	Component Manu	Unknown	N	N	N	1	1915	Y	60,000
Hill AS	Bluemel Bros	Coventry	Component Manu	Unknown	N	N	N	1	1913	Y	Unknown
Hill AS	Coventry Chain Co	Coventry	Component Manu	250	Y	N	N	1	1907	Y	100,000
Hill AS	Smith's Stamping	Coventry	Component Manu	Unknown	N	N	N	1	1917	Y	100,000
Hill AS	Coventry Chain Co	Coventry	Component Manu	4,383	Y	Y	N	1	1902	Y	8,008
Hill BL	Coventry Chain Co	Coventry	Wife of Manufacturer	1	N	Y	N	1	1902	N	8,008
Hill C	Charlesworth Bodies	Coventry	Co Director	Unknown	N	N	N	1	1907	Y	Unknown

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Hill C	Brett's Stamping	Coventry	Unknown	Unknown	N	N	N	0	1899	Y	19,477
Hill C	Brit Piston Ring Co	Coventry	Co Director	400	N	Y	N	1	1911	Y	4,000
Hill CJ	Coventry Chain Co	Coventry	Gentleman	3,419	Y	Y	N	1	1902	Y	8,008
HIll CJ	Brett's Stamping Ltd	Coventry	Gentleman	1	N	N	N	1	1896	Y	40,000
Hill E	Coventry Chain Co	Coventry	Wife of Gentleman	1	N	Y	N	1	1902	N	8,008
Hill JC	Smith's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	Unknown
Hill N	Coventry Chain Co	Coventry	Co Director	Unknown	N	N	N	1	1915	Y	100,000
Hill N	Coventry Chain Co	Coventry	Clerk	201	N	Y	N	1	1902	Y	8,008
Hill PR	Automachinery	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Hill R	Coventry Chain Co	Coventry	Unknown	200	N	Y	N	1	1907	N	100,000
Hillman FM	Automachinery	Coventry	Wife of Cycle Manu	1	N	Y	N	1	1887	N	805
Hillman W	Automachinery	Coventry	Cycle Manu	226	Y	Y	N	2	1887	Y	805
Hodgkinson L	Smith's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	Unknown
Hollick	Hollick & Pratt	Coventry	Body Builder	500	Y	Y	N	2	1911	Y	1,000
Holston CP	ML Magneto	London	Accountant	500	N	N	N	1	1921	N	100,000
Hotckiss et Cie	Hotchkiss et Cie	French Sub	French Sub	Unknown	N	N	Y	0	1916	N	Unknown
Howard W	White & Poppe	Coventry	Solicitor	Unknown	N	N	N	1	1899	Y	Unknown
Hubbard A	Whitley Motor Eng Co	Coventry	Manu	250	Y	N	N	1	1902	Y	500
Humphries HW	Bryce Ltd	Coventry	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Hunter HS	Letchford Swifts Motor Panel Co	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Hurley DH	Johnston Hurley & Martin	Coventry	Engineer	Unknown	Y	Y	N	2	1903	Y	Unknown
Hurley DH	Alpha Engineering	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Hurley EG	Alpha Engineering	Coventry	Engineer	Unknown	N	Y	N	2	1936	Y	Unknown
Jackson FH	Coventry Radiator	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Jackson LH	Coventry Radiator	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
John TG	TG John	Coventry	Component Manu	6,000	Y	N	N	2	1919	Y	16,000
Johnston	Johnston Hurley & Martin	Coventry	Engineer	Unknown	Y	Y	N	2	1903	Y	Unknown
Jones AE	Climax Co	Coventry	Unknown	Unknown	N	N	N	0	1904	N	5,000
Jones Robert	Car Bodies	Coventry	Body Builder	Unknown	Y	Y	N	2	1930	Y	Unknown
Jones WH	Holbrook Bodies Ltd	Unknown	Unknown	Unknown	N	N	N	0	1929	Y	Unknown
Kay JAR	Cornercroft	London	Unknown	Unknown	N	N	N	0	1936	Y	250,000
Keegan FJ	Coventry Chain Co	Coventry	Co Director	Unknown	N	N	N	2	1915	Y	100,000
Keegan FJ	Dunlop Rim & Wheel	Coventry	Co Director	Unknown	N	N	N	2	1915	Y	34,000
Keight AT	Keight A & Co	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Kenward A	Dunlop Rim & Wheel	Unknown	Unknown	Unknown	N	N	Y	0	1926	Y	34,000
King	Coventry Panels	Coventry	Body Builder	Unknown	Y	Y	N	2	1920	Y	Unkonwn
Lacey J	Cheylesmore Sheet Metal	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Lease C	Nero Engine Co	London	Co Director	200	N	N	N	2	1914	Y	4,373
Lee HP	Coventry Climax Engine Co	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Lee LP	Coventry Climax Engine Co	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Lee P	Climax Co	Coventry	Engineer	Unknown	Y	Y	N	2	1904	Y	5,000
Leech RB	Holbrook Bodies Ltd	Unknown	Unknown	Unknown	N	N	N	0	1929	Y	Unknown
Lenard W.J	Hewer Car Bodies	London	Gentleman	300	N	N	N	1	1908	N	2,357
Letchford SA	Letchford Swifts Motor Panel Co	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Lewis HC	BTH	Rugby	Manager	Unknown	N	N	Y	2	1914	Y	Unknown
Lindley WN	Climax Co	Coventry	Co Director	Unknown	N	N	N	2	1904	Y	5,000
Lindley WN	Brit Piston Ring Co	Coventry	Co Director	Unknown	Y	Y	N	2	1911	Y	4,000
Lindley WN	Coventry Chain Co	Coventry	Co Director	Unknown	N	N	N	2	1907	Y	100,000
Lister CA	ML Magneto	Coventry	Co Director	0	N	Y	N	1	1915	Y	15,000
Lister GA	Ml Magneto	Coventry	Engineer	50	Y	N	N	1	1921	Y	100,000
Lister GA	ML Magneto	Coventry	Engineer	10,175	Y	Y	N	1	1915	Y	15,000
Logan FA	Relaince Sheet Metal Wks	Unknown	Component Manu	Unknown	N	N	N	0	1936	Y	Unknown
Longridge CC	Coventry Chain Co	Unknown	Unknown	100	N	N	N	0	1907	N	100,000
Lucas J	ML Magneto	B'ham	Component Manu	93,149	N	N	N	1	1930	Y	100,000
Lusk WC	BTH	Rugby	Manager	Unknown	N	N	Y	2	1914	Y	Unknown

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Mabbutt T	Automachinery	B'ham	Unknown	100	N	N	N	0	1887	Y	805
Mann H	City Carriage Works	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Martin	Johnston Hurley & Martin	Coventry	Engineer	Unknown	Y	Y	N	2	1903	Y	Unknown
Marsh RT	ML Magneto	London	Accountant	500	N	N	N	1	1921	N	100,000
Martin JH	Commercial Dome Wing	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Martin JR	Alpha Engineering	Coventry	Engineer	Unknown	Y	Y	N	2	1936	Y	Unknown
Martin P	Coventry Chain Co	Coventry	Daimler Director	2,600	N	N	N	2	1907	Y	100,000
Mason W	Brett's Stamping ltd	Coventry	Clerk	1	N	N	N	2	1896	Y	40,000
Meates TW	Cornercroft	Unknown	Unknown	1,167	N	N	N	0	1927	Y	2,589
Meats RL	Bluemel Bros	Coventry	Unknown	Unknown	N	N	N	0	1936	Y	90,000
Mendham EW	Forman Motor Co	London	Clerk	1	N	N	N	2	1903	N	1,430
Miller CD	Smith's Stamping	Unknown	Manager	Unknown	N	N	Y	2	1936	Y	250,000
Milstone EMC	Coventry Chain Co	Unknown	Unknown	500	N	N	N	0	1907	N	100,000
Molcom RH	ML Magneto	Coventry & Warks	Engineer	910	N	N	N	2	1915	N	15,000
Moore H	Cross & Ellis Ltd	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Morris A	Relaince Sheet Metal Wks	Unknown	Component Manu	Unknown	N	N	N	0	1936	Y	Unknown
Morris DK	ML Magneto	Coventry & Warks	Engineer	50	Y	N	N	1	1921	Y	100,000
Morris DK	ML Magneto	Coventry & Warks	Engineer	485	Y	N	N	1	1915	Y	15,000
Musson	Cov Motor & Sundries Co Ltd	Coventry	Component Manu	4,000	Y	Y	N	2	1924	Y	8,000
Needle G	Coventry Chain Co	Unknown	Unknown	250	N	N	N	0	1907	N	100,000
Nelson WH	Coventry Chain Co	Coventry	Forman	1	N	N	N	2	1902	N	8,008
Nichols CW	ML Magneto	London	Sales Manager	50	N	N	Y	2	1921	Y	100,000
Noon W	Cheylesmore Sheet Metal	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Ogle JJB	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	19,477
Oubridge WA	Holbrook Bodies Ltd	Coventry	Component Manu	Unknown	Y	N	N	2	1929	Y	Unknown
Oubridge WA	Brit Piston Ring Co	Coventry	Engineer	2,600	Y	Y	N	2	1911	Y	4,000
Oubridge WA	Valves Ltd	Coventry	Component Manu	300	Y	N	N	2	1916	Y	1,010
Oubridge (sen)	Brit Piston Ring Co	Coventry	Market Gardner	300	N	Y	N	2	1911	N	4,000
Page	Doherty Motor Access	Coventry	Clerk	100	Y	N	N	2	1903	Y	200
Parkinson WH	ML Magneto	Coventry & Warks	Doctor	200	N	N	N	1	1915	N	15,000
Parr HP	Gen Accessory Supp Co	Coventry	Engineer	Unknown	Y	Y	N	2	1919	Y	486
Parsons EM	Pistons Ltd	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	500
Parsons H	Pistons Ltd	Coventry	Engineer	Unknown	Y	Y	N	2	1911	Y	500
Parsons H	Pistons Ltd	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	500
Pass E	Thos Pass	Coventry	Body Builder	500	N	Y	N	2	1914	Y	2,000
Pass T	Thos Pass	Coventry	Body Builder	6	Y	Y	N	2	1914	Y	2,000
Payne WS	Payne & Bates	Coventry	Co Director	2,000	Y	Y	N	2	1897	Y	2,000
Peirson ST	Cov Movement Co	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Penson GH	Albion Drop Forgings	Coventry	Daimler Director	Unknown	N	N	N	1	1907	Y	Unknown
Pepper FH	Coventry Chain Co	London	Solicitor	1	N	N	N	1	1902	Y	8,008
Perks C	Pheonix Castings	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Phipps P	Dover Ltd	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Powell-Brett B	Brett's Stamping	Coventry	Engineer	Unknown	N	Y	N	2	1936	Y	60,000
Pratt	Hollick & Pratt	Coventry	Body Builder	500	Y	Y	N	2	1911	Y	1,000
Prestwich	Albion Drop Forgings	Coventry	Unknown	450	Y	N	N	0	1904	Y	2,000
Pridmore MK	Van Raden & Co	Unknown	Unknown	1	N	N	N	0	1903	N	5,004
Proctor H	Albion Drop Forgings	Coventry	Daimler Director	Unknown	N	N	N	1	1907	Y	Unknown
Purdy R	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	60,000
Purdy R	Brett's Stamping	Coventry	Unknown	Unknown	N	N	N	0	1939	Y	100,000
Randall	Torrington Co Ltd	London	Solicitor	0	N	N	Y	1	1929	Y	5,000
Randle F	Randle Radiators	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Rankin J	Van Raden & Co	Coventry	Farmer	1,000	N	Y	N	1	1921	Y	10,000

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Rankin J (sen)	Van Raden & Co	Coventry	Gentleman	1,000	N	Y	N	1	1921	Y	10,000
Rankin R	Van Raden & Co	Coventry	Engineer	4,000	N	Y	N	1	1921	Y	10,000
Rawlings E	Smith's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	Unknown
Reid WR	Torrington Co Ltd	USA	Manager	0	N	N	Y	2	1929	Y	5,000
Remer JR	Thos Pass	Liverpool	Timber Merchant (MP)	2,000	N	N	N	1	1918	Y	4,000
Richmond EW	ML Magneto	Glouster	Co Director	0	N	N	N	2	1915	Y	15,000
Riley A	Midland Motor Body Co	Coventry	Car Manu	1	Y	Y	N	1	1932	Y	10,000
Riley A	Nero Engine Co	Coventry & Warks	Car Manu	413	Y	Y	N	1	1914	Y	4,373
Riley P	Riley Engine Co	Coventry & Warks	Car Manu	1	Y	Y	N	1	1933	Y	100
Riley S	Nero Engine Co	Coventry	Car Manu	413	N	Y	N	1	1914	Y	4,373
Riley T	Nero Engine Co	Coventry	Gentleman	100	N	Y	N	1	1914	N	4,373
Riley V	Nero Engine Co	Coventry	Car Manu	1,151	Y	Y	N	1	1914	Y	4,373
Riley V	Midland Motor Co	Coventry	Car Manu	1	Y	Y	N	1	1932	Y	10,000
Riley V	Albion Drop Forgings	Coventry	Car Manufacturer	150	Y	N	N	1	1904	Y	2,000
Riley W	Nero Engine Co	Coventry	Car Manu	151	N	Y	N	1	1914	Y	4,373
Riley WP	Nero Engine Co	Coventry	Car Manu	412	N	Y	N	1	1914	N	4,373
Robinson CB	Van Raden & Co	Coventry	Gentleman	1,750	Y	Y	N	1	1903	Y	5,004
Robinson VW	Van Raden & Co	Coventry	Solicitor	250	Y	Y	N	1	1903	Y	5,004
Rogers FC	Holbrook Foundry Ltd	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Rogers LH	Forman Motor Co	London	Clerk	1	N	N	N	2	1903	N	1,430
Rollason JEH	Valves Ltd	Unknown	Unknown	333	N	N	N	0	1932	N	8,000
Roraback CE	Torrington Co Ltd	USA	Manager	0	N	N	Y	2	1929	Y	5,000
Rotherham A	Automachinery	Coventry	Silk Dyer	50	N	N	N	2	1887	N	805
Rotherham E	Rotherham & Sons	Coventry	Component Manu	Unknown	N	Y	N	1	1936	Y	Unknown
Rotherham H	Rotherham & Sons	Coventry	Component Manu	Unknown	N	Y	N	1	1936	Y	Unknown
Rotherham K	Rotherham & Sons	Coventry & Warks	Component Manu	Unknown	N	Y	N	1	1936	Y	Unknown
Rotherham K	Hewer Car Bodies	Coventry	Comp Manu	100	N	N	N	1	1908	N	2,357
Rycroft N	Cornercroft	Coventry	Component Manu	888	Y	Y	N	2	1927	Y	2,589
Rycroft N	Cornercroft	Coventry	MD	Unknown	Y	N	N	2	1936	Y	250,000
Savoy M	Coventry Chain Co	Unknown	Unknown	100	N	N	N	0	1907	N	100,000
Sawers R	Climax Co	Coventry	Unknown	Unknown	N	N	N	0	1904	N	5,000
Scott EJ	Bluemel Bros	Coventry	Unknown	Unknown	N	N	N	0	1936	Y	90,000
Scott W	Cross & Ellis Ltd	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Seager WF	Motor Panels	B'ham	Manager	Unknown	N	N	Y	2	1936	Y	Unknown
Shaw J	Morris Motors	Coventry	Manager	0	N	N	Y	2	1936	Y	129,000
Shaw NS	Albion Drop Forging	Unknown	MD	Unknown	N	N	N	0	1936	Y	Unknown
Sheffield A	Van Raden & Co	Unknown	Unknown	1	N	N	N	0	1903	N	5,004
Shelly W	Van Raden & Co	Unknown	Unknown	1	N	N	N	0	1903	N	5,004
Shotton	Albion Drop Forgings	Coventry	Unknown	300	Y	N	N	2	1904	Y	2,000
Shotton FJ	Albion Drop Forging	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Shufflebotham SC	Cov Movement Co	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown
Siddeley JD	Clipper Pnuem Tyre Co	Coventry	Manu	Unknown	Y	N	N	2	1899	Y	130,008
Sidwell W	Brett's Stamping Ltd	Coventry	Clerk	1	N	N	N	2	1896	Y	40,000
Singer JM	Coventry Chain Co	Coventry	Car Manu	500	N	N	N	1	1907	N	100,000
Smith AG	ML Magneto	London	Wks Manager	1,000	N	N	Y	2	1921	Y	100,000
Smith As	Motor Panels	B'ham	Manager	Unknown	N	N	Y	2	1936	Y	Unknown
Smith GE	Reliance Sheet Metal Wks	Unknown	Component Manu	Unknown	N	N	N	0	1936	Y	Unknown
Smith H	Smith's Stamping	B'ham	Manager	Unknown	N	N	Y	2	1936	Y	250,000
Smith H	Zephyr Carburetters Ltd	Coventry	Director of Rover	Unknown	N	N	N	1	1919	Y	10,000
Smith MI	ML Magneto	London	Unknown	50	N	N	N	0	1915	N	15,000
Smith RW	ML Magneto	B'ham	Gentleman	910	N	N	N	1	1915	N	15,000
Smith SM	Valves Ltd	Unknown	Unknown	200	N	N	N	0	1932	N	8,000
Smith T	Smith's Stamping	B'ham	Component Manu	Unknown	Y	N	N	2	1899	Y	Unknown

NAME	FIRM	RES. LOCATION	OCCUPATION	SHARES	FOUNDER	FAMILY	MAN	CLASS	YR.	DIR.	CAPTIAL OF FIRM
Smith & Sons	ML Magneto	London	Component Firm	55,000	N	N	N	0	1921	Y	100,000
Snell S	Clipper Pnuem Tyre Co	Unknown	Unknown	Unknown	Y	N	N	0	1899	Y	130,008
Spencer JF	Priory Acessories	Coventry	Component Manu	50	Y	Y	N	2	1910	Y	100
Spencer TH	Priory Acessories Co	Coventry	Component Manu	50	Y	Y	N	2	1910	Y	100
Spencer WH	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	19,477
Spencer WH	Coventry Chain Co	Unknown	Unknown	150	N	N	N	0	1907	N	100,000
Sporborg HNS	BTH	Rugby	Manager	Unknown	N	N	Y	2	1914	Y	Unknown
Starley JK	Brett's Stamping	Coventry	Director of Rover	Unknown	N	N	N	1	1899	Y	19,477
Starley JP	Van Raden & Co	Coventry	Engineer	4,000	N	Y	N	2	1921	Y	10,000
Starley JP	Van Raden	Coventry	Component Manu	Unknown	N	Y	N	2	1936	Y	Unknown
Starley JP	Van Raden & Co	Coventry	Engineer	10,000	N	Y	N	2	1924	Y	10,000
Starley WL	Van Raden	Coventry	Engineer	Unknown	N	Y	N	2	1936	Y	Unknown
Stonebanks FH	Holbrook Bodies Ltd	Coventry	Manager	Unknown	N	N	N	2	1929	Y	Unknown
Strickland WF	Cornercroft	London	MP	Unknown	N	N	N	1	1936	Y	250,000
Stringer CH	Forman Motor Co	Coventry	Baker	75	N	N	N	2	1908	N	1,427
Sturmey JJH	Bramco (1920) Ltd	Coventry	Car Manu	Unknown	Y	N	N	2	1920	Y	3,750
Sturmey JJH	Hewer Car Bodies	Coventry	Car Manu	300	N	N	N	2	1908	Y	2,357
Sturmey MH	Hewer Car Bodies	Coventry	Spinster	300	N	N	N	2	1908	N	2,357
Sullivan D	Torrington Co Ltd	London	Manager	0	N	N	Y	2	1929	Y	5,000
Sutton H	Commercial Dome Wing	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Swift HJ	Letchford Swifts Motor Panel Co	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Swift VR	Letchford Swifts Motor Panel Co	Coventry	Body Builder	Unknown	N	Y	N	2	1936	Y	Unknown
Taylor E	Holbrook Foundry Ltd	Coventry	Component Manu	Unknown	Y	N	N	2	1936	Y	Unknown
Thorn EW	Motor Panels	B'ham	Manager	Unknown	N	N	Y	2	1936	Y	Unknown
Toole A	Cheylesmore Sheet Metal	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Tuke BB	Dunlop Rim & Wheel	Unknown	Unknown	Unknown	N	N	N	0	1915	Y	34,000
Tunbridge WS	ML Magneto	Coventry & Warks	Solicitor	1,110	N	N	N	1	1915	N	15,000
Turner	Coventry Panels	Coventry	Body Builder	Unknown	Y	Y	N	2	1920	Y	Unknown
Turner HD	Coventry Climax Engine Co	Unknown	Component Manu	Unknown	N	N	N	0	1936	Y	Unknown
Twist GF	Automachinery	Coventry	Solicitor	100	N	N	N	1	1887	Y	805
Twist HG	Automachinery	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Tyler NS	Coventry Motor Fittings	Coventry	Engineer	10,140	Y	Y	N	2	1914	Y	14,101
Tyler WS	Cov Motor Fittings	Coventry	Engineer	Unknown	Y	N	N	2	1936	Y	Unknown
Van Raden E	Van Raden & Co	Coventry	Wife of Engineer	1	N	Y	N	2	1903	N	5,004
Van Raden HW	Van Raden & Co	Coventry	Engineer	2,750	Y	Y	N	2	1903	Y	5,004
Vincent C	Torrington Co Ltd	USA	Manager	0	N	N	Y	2	1929	Y	5,000
Walter L	Smith's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	Unknown
Walton R	Automachinery	Coventry	Cycle Manu	100	N	N	N	2	1887	Y	805
Warren HJC	Gen Accessory Supp Co	Coventry	Engineer	Unknown	Y	Y	N	2	1919	Y	486
Warwick F	Smith's Stamping	Unknown	Unknown	Unknown	N	N	N	0	1899	Y	Unknown
Watson CJ (sen)	ML Magneto	B'ham	Gentleman	400	N	N	N	1	1915	N	15,000
Watson EA	ML Magneto	B'ham	Engineer	260	N	N	Y	1	1915	Y	15,000
Watson EA	ML Magneto	Coventry	Engineer	50	N	N	Y	1	1921	Y	100,000
Wheelan J	Coventry Chain Co	Unknown	Unknown	200	N	N	N	0	1907	N	100,000
Wheeler	Automachinery	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
White AJ	White & Poppe	Coventry	Manu	Unknown	Y	Y	N	2	1899	Y	Unknown
White J	White & Poppe	Coventry	Component Manu	Unknown	Y	N	N	2	1899	Y	Unknown
Whitehouse HA	Brett's Stamping	Coventry	Component Manu	Unknown	N	N	N	2	1939	Y	100,000
Whitehouse HA	Brett's Stamping	Unknown	Unknown	Unknown	N	N	N	2	1936	Y	60,000
Whitehouse J	Brett's Stamping	Coventry	Unknown	Unknown	N	N	N	2	1899	Y	19,477
Willis BW	Willis Panel Co	Coventry	Body Builder	Unknown	Y	Y	N	2	1936	Y	Unknown
Wilson HC	Brit Piston Ring Co	Coventry	Cycle Manu	200	N	N	N	2	1911	Y	4,000

NAME	FIRM	RES. LOCATION	OCCUPATION	SHARES	FOUNDER	FAMILY	MAN	CLASS	YR.	DIR.	CAPTIAL OF FIRM
Wincott AA	Hewer Car Bodies	Coventry	Builder	501	Y	N	N	2	1908	Y	2,357
Winfield WJS	Letchford Swifts Motor Panel Co	Unknown	Unknown	Unknown	N	N	N	0	1936	Y	Unknown
Winn	Albion Drop Forgings	Unknown	Unknown	250	Y	N	N	0	1904	Y	2,000
Winterton HR	Coventry Chain Co	B'ham	Solicitor	1	N	N	N	1	1902	Y	8,008
Wood AEH	Coventry Chain Co	Windermere	Gentleman	10,000	N	N	N	1	1907	Y	100,000
Wright A	Climax Co	Coventry	Unknown	Unknown	N	N	N	0	1904	N	5,000
Wright P	Nero Engine Co	Lancashire	Manu	200	N	N	N	2	1914	N	4,373
Wylie H	Cornercroft	London	Unknown	Unknown	N	N	N	0	1936	Y	250,000
Yeomans CH	Cov Movement Co	Coventry	Component Manu	Unknown	Y	Y	N	2	1936	Y	Unknown

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